

IoT Building Arduino Based Projects

The Internet of Things (IoT) is a global network that links physical objects using Cloud computing, web applications, and network communications. It allows devices to communicate with each other, access information on the Internet, store and retrieve data, and interact with users, creating smart, pervasive and always-connected environments. Despite the Internet of Things being a relatively new concept, there are already a few open platforms available that enable remote and seamless

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management and visualization of sensor data: Cosm, Nimbits, and ThingSpeak are just a few examples. And Arduino works with all of them. The Arduino is an incredibly flexible micro-controller and development environment that cannot only be used to control devices, but can also be used to read data from all kinds of sensors. Its simplicity and extensibility, in addition to its great success and adoption by users, has led to the development of a variety of hardware extensions and software libraries that enable wired and wireless communication with the Internet. Arduino is the ideal open hardware platform for

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experimenting with the world of the Internet of Things. Make your Arduino talk to the world! This book will provide you with all the information you need to design and create your own Internet of Things (IoT) applications using the Arduino platform. More specifically, you will learn: About the Internet of Things and Cloud Computing concepts About open platforms that allow you to store your sensor data on the Cloud (like Cosm, Nimbits and many more) The basic usage of Arduino environment for creating your own embedded projects at low cost How to connect your Arduino with your Android phone and send

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data over the Internet How to connect your Arduino directly to the Internet and talk to the Cloud How to reprogram your Arduino microcontroller remotely through the Cloud Detailed Table of Contents can be found at: <http://www.buildinginternetofthings.com> Updated version (v1.1): Contains corrections, improvements and updates about IoT Platforms! Explore embedded programming, and get hands-on with real-world embedded projects relating to IoT, low-powered devices, and other complex systems using TinyGo and WebAssembly Key Features Build creative embedded apps with TinyGo using low-powered devices and

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microcontrollers Understand the practicality involved in integrating hardware and sensors while programming them using TinyGo Use TinyGo in modern browsers to display embedded applications' statistics on WebAssembly dashboards *Book Description* While often considered a fast and compact programming language, Go usually creates large executables that are difficult to run on low-memory or low-powered devices such as microcontrollers or IoT. TinyGo is a new compiler that allows developers to compile their programs for such low-powered devices. As TinyGo supports all the standard features

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of the Go programming language, you won't have to tweak the code to fit on the microcontroller. This book is a hands-on guide packed full of interesting DIY projects that will show you how to build embedded applications. You will learn how to program sensors and work with microcontrollers such as Arduino UNO and Arduino Nano IoT 33. The chapters that follow will show you how to develop multiple real-world embedded projects using a variety of popular devices such as LEDs, 7-segment displays, and timers. Next, you will progress to build interactive prototypes such as a traffic lights system,

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touchless hand wash timer, and more. As you advance, you'll create an IoT prototype of a weather alert system and display those alerts on the TinyGo WASM dashboard. Finally, you will build a home automation project that displays stats on the TinyGo WASM dashboard. By the end of this microcontroller book, you will be equipped with the skills you need to build real-world embedded projects using the power of TinyGo. What you will learnDiscover a variety of TinyGo features and capabilities while programming your embedded devicesExplore how to use display devices to present your dataFocus on how to make TinyGo

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interact with multiple sensors for sensing temperature, humidity, and pressure
Program hardware devices such as Arduino Uno and Arduino Nano IoT 33 using TinyGo
Understand how TinyGo works with GPIO, ADC, I2C, SPI, and MQTT network protocols
Build your first TinyGo IoT and home automation prototypes
Integrate TinyGo in modern browsers using WebAssembly
Who this book is for
If you are a Go developer who wants to program low-powered devices and hardware such as Arduino UNO and Arduino Nano IoT 33, or if you are a Go developer who wants to extend your knowledge of using Go with WebAssembly while

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programming Go in the browser, then this book is for you. Go hobbyist programmers who are interested in learning more about TinyGo by working through the DIY projects covered in the book will also find this hands-on guide useful.

Presents an introduction to the open-source electronics prototyping platform.

Learn the fundamentals of PLCs and how to control them using Arduino software to create your first Arduino PLC. You will learn how to draw Ladder Logic diagrams to represent PLC designs for a wide variety of automated applications and to convert the diagrams to

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Arduino sketches. A comprehensive shopping guide includes the hardware and software components you need in your tool box. You will learn to use Arduino UNO, Arduino Ethernet shield, and Arduino WiFi shield. Building Arduino PLCs shows you how to build and test a simple Arduino UNO-based 5V DC logic level PLC with Grove Base shield by connecting simple sensors and actuators. You will also learn how to build industry-grade PLCs with the help of ArduiBox. What You'll Learn Build ModBus-enabled PLCs Map Arduino PLCs into the cloud using NearBus cloud connector to control the PLC through the

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Internet Use do-it-yourself light platforms such as IFTTT Enhance your PLC by adding Relay shields for connecting heavy loads Who This Book Is For Engineers, designers, crafters, and makers. Basic knowledge in electronics and Arduino programming or any other programming language is recommended. 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*

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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*

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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

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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 intelligenceStyle and approachA clear step-by-step instruction guide to completing fully-fledged projects in just 7 days

Building Arduino Projects for the Internet of Things

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Android Things Projects

Learn to Use Arduino IoT Cloud to Build IoT Projects

Internet of Things Arduino Handbook

Intel Edison Projects

Practical Arduino

Learn the Internet of Things, build IoT Projects, configure IoT Things, use dashboards and WebHooks, and build IFTTT integrations About This Video Create WebHooks to easily connect backend APIs and services to your Internet of Things (IoT) projects

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Quickly allow Arduino MKR boards to connect securely connect to the cloud Easily, securely, and seamlessly build Arduino Internet of Things (IoT) projects that connect directly with the cloud In Detail In this course, you will learn about the NEW Arduino IoT cloud platform that allows you to easily build the Internet of Things (IoT) applications and projects that connect to the cloud. Go from zero to hero and learn how to use Arduino to

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quickly build a secure Internet of Things (IoT) apps and dashboards that connect to the cloud. In this course, you will learn: A basic understanding of the Internet of Things IoT Terminology What the Arduino IoT cloud platform is How to set up your Arduino MKR boards to connect to the Arduino IoT cloud How to use the Arduino Internet of Things (IoT) cloud platform to build IoT apps with minimal code How to build dashboards to monitor your

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Internet of Things (IoT) projects,
peripherals, and sensors How to
incorporate Webhooks in your Internet
of Things (IoT) applications How to use
If This Then That (IFTTT) to integrate
services into your IoT applications How
to use Arduino MKR boards to prototype
Internet of Things (IoT) projects
Securely connect your Internet of
Things (IoT) device to the cloud The
ins and outs of the Arduino Web Editor
We will start with the basics by

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building simple Internet of Things (IoT) cloud projects, such as:
Controlling an LED from the cloud
Taking analog readings Detecting events from IoT devices such as a button push in the Cloud We will progress to advanced projects such as: Creating a motion sensor alarm circuit that calls your cell phone when motion is detected
Creating a self-regulating, temperature-controlled system You will also learn how to build Internet of Things (IoT)

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dashboards with little or no code to monitor your things and properties from the cloud!

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

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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

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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.

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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

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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

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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

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Learn essential concepts and techniques to build simple-to-advanced projects and overcome common programming challenges in micro:bit development. Beginning BBC micro:bit will take you through the complete features and capabilities of the micro:bit controller, enabling you to program and build your own projects. The uses are endless for the micro:bit and this book will help get you started on building your next project with this

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popular and easy-to-use microcontroller. You'll use online Python Editor and Mu Editor to build your own applications. Reviewed by the micro:bit developer team, this comprehensive guide also provides clean code examples to help you learn the key concepts behind the micro:bit API. What You'll Learn Work with the various kits and accessories Master the micro:bit development platform with easy to follow examples and clean code Build

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your own micro:bit applications using an online Python editor and Mu editor Use the on-board LED matrix, built-in buttons, I/O pins, accelerometer, and compass Learn how to connect and communicate with devices through I2C, SPI, and UART Build applications with music and speech libraries Use Local Persistent File System to store and manipulate files Build applications based on wired and radio networks Use micro:bit and micro:bit Blue apps Who

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This Book Is For Beginners, those already experienced with electronics, and hobbyists at all levels looking to get started with a new microcontroller. Master the technique of using ESP32 as an edge device in any IoT application where wireless communication can make life easier

Key Features

- Gain practical experience in working with ESP32
- Learn to interface various electronic devices such as sensors, integrated circuits (ICs), and displays
- Apply your knowledge

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to build real-world automation projectsBook Description Developing IoT Projects with ESP32 provides end-to-end coverage of secure data communication techniques from sensors to cloud platforms that will help you to develop production-grade IoT solutions by using the ESP32 SoC. You'll learn how to employ ESP32 in your IoT projects by interfacing with different sensors and actuators using different types of serial protocols. This book will show

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you how some projects require immediate output for end-users, and cover different display technologies as well as examples of driving different types of displays. The book features a dedicated chapter on cybersecurity packed with hands-on examples. As you progress, you'll get to grips with BLE technologies and BLE mesh networking and work on a complete smart home project where all nodes communicate over a BLE mesh. Later chapters will

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show you how IoT requires cloud connectivity most of the time and remote access to smart devices. You'll also see how cloud platforms and third-party integrations enable endless possibilities for your end-users, such as insights with big data analytics and predictive maintenance to minimize costs. By the end of this book, you'll have developed the skills you need to start using ESP32 in your next wireless IoT project and meet the project's

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requirements by building effective, efficient, and secure solutions. What you will learn

Explore advanced use cases like UART communication, sound and camera features, low-energy scenarios, and scheduling with an RTOS

Add different types of displays in your projects where immediate output to users is required

Connect to Wi-Fi and Bluetooth for local network communication

Connect cloud platforms through different IoT messaging

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protocolsIntegrate ESP32 with third-party services such as voice assistants and IFTTTDiscover best practices for implementing IoT security features in a production-grade solutionWho this book is for If you are an embedded software developer, an IoT software architect or developer, a technologist, or anyone who wants to learn how to use ESP32 and its applications, this book is for you. A basic understanding of embedded systems, programming, networking, and

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cloud computing concepts is necessary to get started with the book.

This is the book for you if you are a student, hobbyist, developer, or designer with little or no programming and hardware prototyping experience, and you want to develop IoT applications. If you are a software developer or a hardware designer and want to create connected devices applications, then this book will help you get started.

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IoT System Design

The essential techniques you need to develop Arduino-based PLCs

TinyML

Realization with Raspberry Pi, NodeMCU and Arduino

Smart Buildings Digitalization

Hands-On Internet of Things with Blynk

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

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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

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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

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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

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devices.

Build powerful Robots and IoT solutions using Intel Edison About This Book Learn to build advanced level robots with Intel Edison and Arduino Efficiently build and program home automation and IoT projects with Intel Edison Master the skills of creating enticing projects with Intel Edison. Who This Book Is For If you are a hobbyist, robot engineer, IoT enthusiast, programmer, or developer who wants to create autonomous projects with Intel Edison, then this book is for you. Prior programming knowledge would be beneficial. What You Will Learn

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***Program your device using the Arduino processor language, Python, and Node.js Interface
different sensors with the Intel Edison Build a home automation system using MQTT, Android, and WPF Perform face detection using Intel Edison Develop a high-speed line follower robot Control a robot using a PC application and an custom controller In Detail Change the way you look at embedded electronics with Intel Edison. It is a small computing platform packed with a set of robust features to deliver hands-on performance, durability, and software support. This book is a perfect place to kickstart***

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development and rapid prototyping using Intel Edison. It will start by introducing readers to the Intel Edison board and explaining how to get started with it. You will learn how to build a mini weather station, which will help you to acquire temperature and smoke level and push it to the IoT platform. Then you will see how to build a home automation device and control your appliances using an Android app. Furthermore, we will build a security system using a webcam to detect faces and perform voice recognition. Toward the end, the book will demonstrate how you can build two robots, which will be based on

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different line sensing sensors and can be controlled by a PC. The book will guide the readers through each and every step of execution of a project, using Intel Edison. Style and approach A project-based guide that will take the readers through various domains of projects like robotics, IoT and so on. Deep learning networks are getting smaller. Much smaller. The Google Assistant team can detect words with a model just 14 kilobytes in size—small enough to run on a microcontroller. With this practical book you'll enter the field of TinyML, where deep learning and embedded

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systems combine to make astounding things possible with tiny devices. Pete Warden and Daniel Situnayake explain how you can train models small enough to fit into any environment. Ideal for software and hardware developers who want to build embedded systems using machine learning, this guide walks you through creating a series of TinyML projects, step-by-step. No machine learning or microcontroller experience is necessary. Build a speech recognizer, a camera that detects people, and a magic wand that responds to gestures Work with Arduino and ultra-low-power microcontrollers Learn the

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essentials of ML and how to train your own models Train models to understand audio, image, and accelerometer data Explore TensorFlow Lite for Microcontrollers, Google's toolkit for TinyML Debug applications and provide safeguards for privacy and security Optimize latency, energy usage, and model and binary size

Leverage your Arduino skills in the Raspberry Pi world and see how to cross the two platforms into sophisticated programs. The Arduino and Raspberry Pi communities overlap more than you might think. Arduinos can be expanded to have

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network capabilities with a variety of “shields,” all of which increase the cost and complexity of the system. By contrast, Raspberry Pis all run Linux, which is a very network-competent platform. The newest Pi, the Raspberry Pi Zero W, is WiFi and Bluetooth capable, and costs around \$10 U.S. For network enabled gadgets, it makes far more sense to cross to the Raspberry PI platform, if only someone would make it easy to do. That's what this book is about. You'll learn some survival level Linux system administration, so you know how to set the machine up and how to establish at least minimal security for your

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gadget. You'll set up and learn the Geany IDE on your Pi, which is fairly similar to the Arduino IDE. Where the two platforms overlap the most is the GPIO system. You'll see that several projects use and explain the WiringPi system. This is is deliberately similar to the Arduino's 'Wiring' functionality, which is how sketches interact with GPIO pins. You'll learn the differences between the GPIO pins of the two devices, and how the Pi has some limitations on those pins that the Arduino does not. As a final project, in an effort to escape some of those limitations, you'll attach an AtMEGA 328P to the Raspberry Pi and

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configure it as a real, 8MHz Arduino with the Arduino IDE running on the Pi, and learn how to have the two platforms communicate, giving you the best of both worlds. What You'll Learn
Establish security with Linux system administration Set up the Apache webserver Write CGI programs so other computers can connect to your Pi and pull data in from it. Use C/C++ from Arduino sketches to write programs for the Pi Who This Book Is For The Arduino user who's been through all the tutorials and is comfortable writing sketches and connecting hardware to their Arduino.

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Create your own LoRa wireless projects for non-industrial use and gain a strong basic understanding of the LoRa technology, LoRa WAN, and LPWAN. You'll start by building your first LoRa wireless channel and then move on to various interesting projects such as setting up networks with a LoRa gateway, communicating with IoT servers using RESTful API and MQTT protocol, and real-time GPS tracking. With LoRa wireless and LoRaWAN, you can build a wide array of applications in the area of smart agriculture, smart cities, smart environment, smart healthcare, smart homes and buildings,

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smart industrial control, smart metering, smart supply chain and logistics. Beginning LoRa Radio Networks with Arduino provides a practical introduction and uses affordable and easy to obtain hardware to build projects with the Arduino development environment. What You'll Learn Understand the hardware need to build LoRaWAN Use the Arduino development environment to write codeConnect to Arduino hardware and upload programs and communicate with them Setup networks with LoRa gateway Show real time track with tail, and path history Who This Book Is For Inventors,

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hackers, crafters, students, hobbyists, and scientists

Beginning IoT Projects

IoT and Energy Efficient Smart Buildings

Architecture and Applications

Building Arduino PLCs

Building IoT and Network Applications and Devices

Raspberry Pi for Arduino Users

Intelligent IoT Projects in 7 Days

Arduino is a powerful and very versatile platform used by millions of people around the world to create DIY electronics projects. It can be connected to a wide variety of sensors and other components,

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making it the ideal platform to build amazing Internet of Things (IoT) projects on the next wave in the era of computing. This book takes a recipe-based approach, giving you precise examples on how to build IoT projects of all types using the Arduino platform. You will come across projects from several fields, including the popular robotics and home automation domains. Along with being introduced to several forms of interactions within IoT, including projects that directly interact with well-known web services such as Twitter, Facebook, and Dropbox we will also focus on Machine-to-Machine (M2M) interactions, where Arduino projects interact without any human intervention. You will learn to build a few quick and easy-to-make fun projects that will really expand your horizons in the world of IoT and Arduino. Each chapter ends with a troubleshooting recipe that will help you overcome any problems

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faced while building these projects. By the end of this book, you will not only know how to build these projects, but also have the skills necessary to build your own IoT projects in the future.

This book presents the proceedings of the 2019 International Scientific and Technical Conference “ Integrated Computer Technologies in Mechanical Engineering ” – Synergetic Engineering (ICTM ’ 2019). The ICTM was established by the National Aerospace University “ Kharkiv Aviation Institute ” to bring together outstanding researchers and practitioners in the fields of information technology in the design and manufacture of engines, creation of rocket space systems, and aerospace engineering from around the globe all to share their knowledge and expertise. The ICTM ’ 2019 conference was held in Kharkiv, Ukraine, on November 28 – 30, 2019. During the event, technical exchanges

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between the research communities took place in the form of keynote speeches, panel discussions, and special sessions. In addition, participants had the opportunity to forge new collaborations with their fellow researchers. ICTM ' 2019 received 172 submissions from various countries. This book features selected papers offering insights into the following topics: Information technology in the design and manufacture of engines; Information technology in the creation of rocket space systems; Aerospace engineering; Transport systems and logistics; Big data and data science; Nano-modeling; Artificial intelligence and smart systems; Networks and communication; Cyber-physical system and IoE; Software Engineering and IT-infrastructure. The organizers of ICTM 2019 made great efforts to ensure the success of this conference. The authors would like to thank all the members of the ICTM ' 2019

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Advisory Committee for their guidance and advice, the members of Program Committee and Organizing Committee, the referees for their time and effort in reviewing and soliciting the papers, and the authors for their contributions to the formation of a common intellectual environment for solving relevant scientific problems.

Also, the authors are grateful to Springer, especially Janusz Kacprzyk and Thomas Ditzinger as the editors responsible for the series “ Advances in Intelligent System and Computing ” for their valuable support in publishing these selected papers.

This book discusses various artificial intelligence and machine learning applications concerning smart buildings. It includes how renewable energy sources are integrated into smart buildings using suitable power electronic devices. The deployment of advanced technologies with monitoring, protection, and energy management

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features is included, along with a case study on automation. Overall, the focus is on architecture and related applications, such as power distribution, microgrids, photovoltaic systems, and renewable energy aspects. The chapters define smart building concepts and their related benefits. FEATURES Discusses various aspects of the role of the Internet of things (IoT) and machine learning in smart buildings Explains pertinent system architecture and focuses on power generation and distribution Covers power-enabling technologies for smart cities Includes photovoltaic system-integrated smart buildings This book is aimed at graduate students, researchers, and professionals in building systems engineering, architectural engineering, and electrical engineering. Building Arduino Projects for the Internet of Things Experiments with Real-World Applications Apress

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Discover how to build your own smart Internet of Things projects and bring a new degree of interconnectivity to your world About This Book Learn how to extract and analyse data from physical devices and build smart IoT projects Master the skills of building enticing projects such as a neural network autonomous car, computer vision through a camera, and cloud-based IoT applications This project-based guide leverages revolutionary computing chips such as Raspberry Pi, Arduino, and so on Who This Book Is For If you are hobbyist who is keen on making smart IoT projects, then this book is for you. You should have a basic knowledge of Python. What You Will Learn Implement data science in your IoT projects and build a smart temperature controller Create a simple machine learning application and implement decision system concepts Develop a vision machine using

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OpenCV Build a robot car with manual and automatic control
Implement speech modules with your own voice commands for IoT projects
Connect IoT to a cloud-based server In Detail Internet of Things (IoT) is a groundbreaking technology that involves connecting numerous physical devices to the Internet and controlling them. Creating basic IoT projects is common, but imagine building smart IoT projects that can extract data from physical devices, thereby making decisions by themselves. Our book overcomes the challenge of analyzing data from physical devices and accomplishes all that your imagination can dream up by teaching you how to build smart IoT projects. Basic statistics and various applied algorithms in data science and machine learning are introduced to accelerate your knowledge of how to integrate a decision system into a physical device. This book contains IoT

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projects such as building a smart temperature controller, creating your own vision machine project, building an autonomous mobile robot car, controlling IoT projects through voice commands, building IoT applications utilizing cloud technology and data science, and many more. We will also leverage a small yet powerful IoT chip, Raspberry Pi with Arduino, in order to integrate a smart decision-making system in the IoT projects. Style and approach The book follows a project-based approach to building smart IoT projects using powerful boards such as the Raspberry Pi, Arduino, and the IoT chip.

Build exciting and powerful IoT projects using the all-new Espressif ESP32

Raspberry Pi 3 Home Automation Projects

Internet of Things Projects with ESP32

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Raspberry Pi 3 Projects for Java Programmers

Build on the power of Blynk to configure smart devices and build exciting IoT projects

Project Based Approach

Build simple yet amazing robotics projects using ESP8266 About This Book Get familiar with ESP8266 and its features. Build Wi-Fi controlled robots using ESP8266 A project based book that will use the ESP8266 board and some of its popular variations to build robots. Who This Book Is For This book is

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targeted at enthusiasts who are interested in developing low-cost robotics projects using ESP8266. A basic knowledge of programming will be useful but everything you need to know is are covered in the book. What You Will Learn Build a basic robot with the original ESP8266, Arduino UNO, and a motor driver board. Make a Mini Round Robot with ESP8266 HUZDAH Modify your Mini Round Robot by integrating encoders with motors Use the Zumo chassis kit to

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build a line-following robot by connecting line sensors Control your Romi Robot with Wiimote Build a Mini Robot Rover chassis with a gripper and control it through Wi-Fi Make a robot that can take pictures In Detail The ESP8266 Wi-Fi module is a self-contained SOC with an integrated TCP/IP protocol stack and can give any microcontroller access to your Wi-Fi network. It has a powerful processing and storage capability and also supports application

hosting and Wi-Fi networking. This book is all about robotics projects based on the original ESP8266 microcontroller board and some variants of ESP8266 boards. It starts by showing all the necessary things that you need to build your development environment with basic hardware and software components. The book uses the original ESP8266 board and some variants such as the Adafruit HUZZAH ESP8266 and the Adafruit Feather HUZZAH ESP8266 . You

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will learn how to use different type of chassis kits, motors, motor drivers, power supplies, distribution boards, sensors, and actuators to build robotics projects that can be controlled via Wi-Fi. In addition, you will learn how to use line sensors, the ArduiCam, Wii Remote, wheel encoders, and the Gripper kit to build more specialized robots. By the end of this book, you will have built a Wi-Fi control robot using ESP8266. Style and approach A project-based guide that

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will help you build exciting robotics using ESP8266.

Explore and learn about Internet of Things to develop interactive Arduino-based Internet projects About This Book- Learn the capabilities and differences between popular protocols and communication patterns and how they can be used, and should not be used, to create secure and interoperable services and things- Build Internet-based Arduino devices to make your home feel more

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secure- Learn to protect cyber-physical systems and utilize forensic data analysis to beat vulnerabilities in your IoT ecosystem- Learn best practices to secure your data from device to the cloud
Who This Book Is For
If you're a developer or electronics engineer who is curious about Internet of Things, then this is the course for you. A rudimentary understanding of electronics, Raspberry Pi, or similar credit-card sized computers, and some programming

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experience using managed code such as C# or Java will be helpful. Business analysts and managers will also find this course useful. What You Will Learn - Know the capabilities and limitations of the HTTP, UPnP, CoAP, MQTT, and XMPP protocols- Use important communication patterns, such as the request/respond, publish/subscribe, event subscription, asynchronous messaging, and multicasting patterns- Build a portable Wi-Fi signal strength sensor to give

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haptic feedback about signal strength to the user- Measure the water flow speed and volume with liquid flow sensors and record real-time readings- Secure your home with motion-activated Arduino security cameras and upload images to the cloud- Implement real-time data logging of a solar panel voltage with Arduino cloud connectors- Track locations with GPS and upload location data to the cloud- Control infrared-enabled devices with IR remote and

Arduino- Use Systems Security Engineering and Privacy-by-design principles to design a secure IoT ecosystem
In Detail
The IoT: Building Arduino-Based Projects course will take you on a journey to become an expert in the use of IoT by developing a set of projects and finally guide you onto securing your IoT environment.
The course begins with exploring the popular HTTP, UPnP, CoAP, MQTT, and XMPP protocols. In the first module Learning

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Internet of Things, you will learn how protocols and patterns can put limitations on network topology and how they affect the direction of communication and the use of firewalls. This module gives you a practical overview of the existing protocols, communication patterns, architectures, and security issues important to Internet of Things. The second module, Internet of Things with Arduino Blueprints provides you up to eight projects that will allow

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devices to communicate with each other, access information over the Internet, store and retrieve data, and interact with users'creating smart, pervasive, and always-connected environments. You can use these projects as blueprints for many other IoT projects and put them to good use.It has becomes critical to ensure that cyber security threats are contained to a minimum when implementing new IoT services and solutions. Thus, our third module,

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Practical Internet of Things Security provides a set of guidelines to architect and deploy a secure IoT in your Enterprise. The aim is to showcase how the IoT is implemented in early adopting industries and describe how lessons can be learned and shared across diverse industries to support a secure IoT. Style and approach This course introduces you to the Internet of Things architecture, helps you build Arduino projects based on IoT and cloud computing concepts,

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create smart, pervasive and always-connected environments, and finally guide you onto securing your IoT environment. Each of these has been covered in individual modules so that you develop your skill after the completion of a module and get ready for the next

This is a book about building Arduino-powered devices for everyday use, and then connecting those devices to the Internet. If you're one of the many who

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have decided to build your own Arduino-powered devices for IoT applications, you've probably wished you could find a 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. Building Arduino Projects for the Internet of Things: Experiments with Real-World Applications is exactly what you need. Written by a software developer and

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solution architect who got tired of hunting and gathering various lessons for Arduino development as he taught himself all about the topic, this book gives you an incredibly strong foundation of Arduino-based device development, from which you can go in any direction according to your specific development needs and desires. Readers are introduced to the building blocks of IoT, and then deploy those principles to by building a variety of useful projects.

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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. What You'll Learn: Connect an Arduino device to the Internet Creating an Arduino circuit that senses temperature Publishing data

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***collected from an Arduino to a server
and to an MQTT broker Setting up
channels in Xively Setting up an app in
IBM Bluematrix Using Node-RED to
define complex flows Publishing data
visualization in a web app Reporting
motion-sensor data through a mobile
app Creating a remote control for house
lights Creating a machine-to-machine
communication requiring no human
intervention Creating a location-aware
device ket="" of="" new=""***

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enthusiasts="" all="" ages="" who="" are="" just="" starting="" out="" with="" iot="" device="" development. 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

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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

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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

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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,

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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 Experiment with building IoT projects without the demanding time or patience required to learn about electronics. This

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book thoroughly introduces readers of all ages to the world of IoT devices and electronics without getting bogged down by the overly technical aspects or being tied to a specific platform. You'll learn IoT, Arduino, Raspberry Pi from the ground up using the Qwiic and Grove components systems. The book begins with a brief overview of IoT followed by primers for the two most popular platforms; Arduino and Raspberry Pi. There is also a short tutorial on

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programming each host; Arduino C-like sketches and Python scripts respectfully. Thus, the book also helps you get started with your choice of platform. Next, you'll learn the basics for the Qwiic and Grove component systems. The rest of the book presents a number of projects organized into easy-to-follow chapters that details the goal for the project, the components used, a walk-through of the code, and a challenge section that provides suggestions on

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how to improve or augment the project. Projects are presented for both the Arduino and Raspberry Pi where possible making each project as versatile as possible. What You'll Learn Write Arduino sketches Create Python scripts for the Raspberry Pi Build IoT projects with Arduino and Raspberry Pi Use the Qwiic and Grove component systems Join the electronics and IoT hobby world with almost no experience Host projects data in the cloud using ThingSpeak Who This

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Book Is For Those interested in building or experimenting with IoT solutions but have little or no experience working with electronics. This includes those with little or no programming experience. A secondary target would include readers interested in teaching the basics of working with Arduino and Raspberry Pi to others.

***Building NodeBots with Johnny-Five, Raspberry Pi, Arduino, and BeagleBone
DIY Wi-Fi controlled robots***

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A practical guide to building embedded applications for low-powered devices, IoT, and home automation
Building Internet of Things with the Arduino

Getting Started with Arduino
Smart Internet of Things Projects

Create your own IoT projects DESCRIPTION
The book has been written in such a way that the concepts are explained in detail. It is entirely based on the practical experience of the authors while undergoing projects with students and industries, giving adequate

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emphasis on circuits and code examples. To make the topics more comprehensive, circuit diagrams, photographs and code samples are furnished extensively throughout the book. The book is conceptualized and written in such a way that the beginner readers will find it very easy to understand and implement the circuits and programs. The objective of this book is to discuss the various projects based on the Internet of Things (IoT). KEY FEATURES

- Comprehensive coverage of various aspects of IoT concepts
- Covers various Arduino boards and shields
- Simple language, crystal clear approach and straight forward

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comprehensible presentation Adopting user-friendly style for the explanation of circuits and examples

- Includes basics of Raspberry Pi and related projects
- WHAT WILL YOU LEARN
 - Internet of Things, IoT-Based Smart Camera, IoT-Based Dust Sampler
 - Learn to create ESP8266-Based Wireless Web Server and Air Pollution Meter Using Raspberry Pi, Smart Garage Door, Baggage Tracker, Smart Trash Collector, Car parking system, Home Automation
 - Windows 10 on Raspberry and know to create Wireless Video Surveillance Robot Using Raspberry Pi
- WHO THIS BOOK IS FOR
 - Students pursuing BE/BSc/ME/MSc/BTech/MTech

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in Computer Science, Electronics, Electrical.
TABLE OF CONTENTS 1. ESP8266-Based Wireless
Web Server 2. Air Pollution Meter Using
Raspberry Pi 3. Smart Garage Door 4. Baggage
Tracker 5. Smart Trash Collector 6. Car
parking system 7. Home Automation 8.
Environmental Parameter Monitoring 9.
Intelligent System for the Blind 10. Sign to
Speech Using the IoTs 11. Windows 10 on
Raspberry 12. Wireless Video Surveillance
Robot Using Raspberry Pi 13. IoT-Based Smart
Camera 14. IoT-Based Dust Sampler and Air
Quality Monitoring System
Develop Internet of Things projects with

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Sketch to build your Arduino programs. This book is a quick reference guide to getting started with Nano 33 IoT, Arduino's popular IoT board. You'll learn how to access the Arduino I/O, understand the WiFi and BLE networks, and optimize your board by connecting it to the Arduino IoT Cloud. Arduino Nano 33 IoT is designed to build IoT solutions with supported WiFi and BLE networks. This board can be easily extend through I/O pins, sensors and actuators. Beginning Arduino Nano 33 IoT is the perfect solution for those interested in learning how to use the latest technology and project

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samples through a practical and content-driven approach. What You'll Learn Prepare and set up Arduino Nano 33 IoT board Operate Arduino Nano 33 IoT board hardware and software Develop programs to access Arduino Nano 33 IoT board I/O Build IoT programs with Arduino Nano 33 IoT board Who This Book Is For Makers, developers, students, and professional of all levels.

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

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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.

If you are a hobbyist who wants to develop projects based on Arduino as the main microcontroller platform or an engineer interested in finding out what the Arduino platform offers, then this book is ideal for you. Some prior knowledge of the C programming language is required.

“With futuristic homes on the rise, learn to

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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

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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

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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

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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

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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.

Python Programming for Arduino

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Beginning LoRa Radio Networks with Arduino

Beginning BBC micro:bit

Cool Projects for Open Source Hardware

IoT based Projects

Step-By-Step Internet of Things Projects

In this DIY guide, you will learn how to use Arduino – the open-source hardware board for makers, hobbyists, and inventors. You will learn how to develop your own projects, create prototypes, and produce professional-quality embedded systems. A simple step-by-step demonstration system accompanies you from vision to reality – and just like riding a bike, you ’ ll get better at it, the more you do it. Featuring a wealth of detailed

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diagrams and more than 50 fully functional examples, this book will help you get the most out of this versatile tool and bring your electronic inventions to life.

Build simple yet amazing robotics projects using ESP8266

About This Book* Get familiar with ESP8266 and its features.* Build Wi-Fi controlled robots using ESP8266* A project based book that will use the ESP8266 board and some of its popular variations to build robots.

Who This Book Is For This book is targeted at enthusiasts who are interested in developing low-cost robotics projects using ESP8266. A basic knowledge of programming will be useful but everything you need to know is covered in the

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book. What You Will Learn* Build a basic robot with the original ESP8266, Arduino UNO, and a motor driver board.* Make a Mini Round Robot with ESP8266 HUZAH* Modify your Mini Round Robot by integrating encoders with motors* Use the Zumo chassis kit to build a line-following robot by connecting line sensors* Control your Romi Robot with Wiimote* Build a Mini Robot Rover chassis with a gripper and control it through Wi-Fi* Make a robot that can take pictures

In Detail The ESP8266 Wi-Fi module is a self-contained SOC with an integrated TCP/IP protocol stack and can give any microcontroller access to your Wi-Fi network. It has a powerful processing and storage capability and also

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supports application hosting and Wi-Fi networking. This book is all about robotics projects based on the original ESP8266 microcontroller board and some variants of ESP8266 boards. It starts by showing all the necessary things that you need to build your development environment with basic hardware and software components. The book uses the original ESP8266 board and some variants such as the Adafruit Huzzah ESP8266 and the Adafruit Feather Huzzah ESP8266 . You will learn how to use different type of chassis kits, motors, motor drivers, power supplies, distribution boards, sensors, and actuators to build robotics projects that can be controlled via Wi-Fi. In addition, you will

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learn how to use line sensors, the ArduiCam, Wii Remote, wheel encoders, and the Gripper kit to build more specialized robots. By the end of this book, you will have built a Wi-Fi control robot using ESP8266. Style and approach A project-based guide that will help you build exciting robotics using ESP8266.

Create your own Arduino-based designs, gain in-depth knowledge of the architecture of Arduino, and learn the user-friendly Arduino language all in the context of practical projects that you can build yourself at home. Get hands-on experience using a variety of projects and recipes for everything from home automation to test equipment. Arduino has taken off as an incredibly

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popular building block among ubicomp (ubiquitous computing) enthusiasts, robotics hobbyists, and DIY home automation developers. Authors Jonathan Oxer and Hugh Blemings provide detailed instructions for building a wide range of both practical and fun Arduino-related projects, covering areas such as hobbies, automotive, communications, home automation, and instrumentation. Take Arduino beyond "blink" to a wide variety of projects from simple to challenging Hands-on recipes for everything from home automation to interfacing with your car engine management system Explanations of techniques and references to handy resources for ubiquitous computing projects

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Supplementary material includes a circuit schematic reference, introductions to a range of electronic engineering principles and general hints & tips. These combine with the projects themselves to make Practical Arduino: Cool Projects for Open Source Hardware an invaluable reference for Arduino users of all levels.

You'll learn a wide variety of techniques that can be applied to your own projects.

Over 60 recipes will help you build smart IoT solutions and surprise yourself with captivating IoT projects you thought only existed in Bond movies About This Book This book offers key solutions and advice to address the hiccups faced when working on Arduino-based IoT

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projects in the real world Take your existing skills and capabilities to the next level by building challenging IoT applications with ease. Be the tech disruptor you always wanted to be with key recipes that help you solve Arduino IoT related problems smarter and faster. Put IoT to work through recipes on building Arduino-based devices that take control of your home, health, and life! Who This Book Is For This book is primarily for tech enthusiasts and early IoT adopters who would like to make the most of IoT and address the challenges encountered while developing IoT-based applications with Arduino. This book is also good for developers with basic electronics knowledge who need help to

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successfully build Arduino projects. What You Will Learn Monitor several Arduino boards simultaneously Tweet sensor data directly from your Arduino board Post updates on your Facebook wall directly from your Arduino board Create an automated access control with a fingerprint sensor Control your entire home from a single dashboard Make a GPS tracker that you can track in Google Maps Build a live camera that streams directly from your robot In Detail Arduino is a powerful and very versatile platform used by millions of people around the world to create DIY electronics projects. It can be connected to a wide variety of sensors and other components, making it the ideal platform to build

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amazing Internet of Things (IoT) projects on—the next wave in the era of computing. This book takes a recipe-based approach, giving you precise examples on how to build IoT projects of all types using the Arduino platform. You will come across projects from several fields, including the popular robotics and home automation domains. Along with being introduced to several forms of interactions within IoT, including projects that directly interact with well-known web services such as Twitter, Facebook, and Dropbox we will also focus on Machine-to-Machine (M2M) interactions, where Arduino projects interact without any human intervention. You will learn to build a few quick and

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easy-to-make fun projects that will really expand your horizons in the world of IoT and Arduino. Each chapter ends with a troubleshooting recipe that will help you overcome any problems faced while building these projects. By the end of this book, you will not only know how to build these projects, but also have the skills necessary to build your own IoT projects in the future.

Style and approach This book takes a recipe-based approach, giving you precise examples on how to build IoT projects using the Arduino platform. You will learn to build fun and easy projects through a task-oriented approach.

Create and program Internet of Things projects using

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the Espressif ESP32. Key Features Getting to know the all new powerful ESP32 boards and build interesting Internet of Things projects Configure your ESP32 to the cloud technologies and explore the networkable modules that will be utilised in your IoT projects A step-by-step guide that teaches you the basic to advanced IoT concepts with ESP32 Book Description ESP32 is a low-cost MCU with integrated Wi-Fi and BLE. Various modules and development boards-based on ESP32 are available for building IoT applications easily. Wi-Fi and BLE are a common network stack in the Internet of Things application. These network modules can leverage your business and projects needs for cost-

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effective benefits. This book will serve as a fundamental guide for developing an ESP32 program. We will start with GPIO programming involving some sensor devices. Then we will study ESP32 development by building a number of IoT projects, such as weather stations, sensor loggers, smart homes, Wi-Fi cams and Wi-Fi wardriving. Lastly, we will enable ESP32 boards to execute interactions with mobile applications and cloud servers such as AWS. By the end of this book, you will be up and running with various IoT project-based ESP32 chip. What you will learn Understand how to build a sensor monitoring logger Create a weather station to sense temperature and humidity using ESP32

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Build your own W-iFi wardriving with ESP32. Use BLE to make interactions between ESP32 and Android Understand how to create connections to interact between ESP32 and mobile applications Learn how to interact between ESP32 boards and cloud servers Build an IoT Application-based ESP32 board Who this book is for This book is for those who want to build a powerful and inexpensive IoT projects using the ESP32. Also for those who are new to IoT, or those who already have experience with other platforms such as Arduino, ESP8266, and Raspberry Pi.

Internet of Things with Arduino Blueprints
Step-By-Step Projects for Beginners

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Designing Embedded Systems with Arduino

Breadboard-less Electronic Projects

Machine Learning with TensorFlow Lite on Arduino and

Ultra-Low-Power Microcontrollers

Internet of Things with Arduino Cookbook

The widespread availability of technologies has increased exponentially in recent years. This ubiquity has created more connectivity and seamless integration among technology devices. Emerging Trends and Applications of the Internet of Things is an essential reference publication featuring the latest scholarly

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research on the surge of connectivity between computing devices in modern society, as well as the benefits and challenges of this. Featuring extensive coverage on a broad range of topics such as cloud computing, spatial cognition, and ultrasonic sensing, this book is ideally designed for researchers, professionals, and academicians seeking current research on upcoming advances in the Internet of Things (IoT).

Connect things to create amazing IoT applications in minutes Key Features Use Blynk

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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-n-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,

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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

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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

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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. Develop smart Internet of things projects using

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Android Things. About This Book Learn to build promising IoT projects with Android Things Make the most out of hardware peripherals using standard Android APIs Build enticing projects on IoT, home automation, and robotics by leveraging Raspberry Pi 3 and Intel Edison Who This Book Is For This book is for Android enthusiasts, hobbyists, IoT experts, and Android developers who want to gain a deeper knowledge of Android Things. The main focus is on implementing IoT projects using Android Things. What You Will Learn Understand IoT

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ecosystem and the Android Things role See the Android Things framework: installation, environment, SDK, and APIs See how to effectively use sensors (GPIO and I2C Bus) Integrate Android Things with IoT cloud platforms Create practical IoT projects using Android Things Integrate Android Things with other systems using standard IoT protocols Use Android Things in IoT projects In Detail Android Things makes developing connected embedded devices easy by providing the same Android development tools, best-in-class Android

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framework, and Google APIs that make developers successful on mobile. With this book, you will be able to take advantage of the new Android framework APIs to securely build projects using low-level components such as sensors, resistors, capacitors, and display controllers. This book will teach you all you need to know about working with Android Things through practical projects based on home automation, robotics, IoT, and so on. We'll teach you to make the most of the Android Things and build enticing projects such as a smart

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greenhouse that controls the climate and environment automatically. You'll also create an alarm system, integrate Android Things with IoT cloud platforms, and more. By the end of this book, you will know everything about Android Things, and you'll have built some very cool projects using the latest technology that is driving the adoption of IoT. You will also have primed your mindset so that you can use your knowledge for profitable, practical projects.

Style and approach This book is packed with fun-filled, end-to-end projects that you will be

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encouraged to experiment on the Android Things OS.

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

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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 electrical 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

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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,

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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,

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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

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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

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also enhance or modify the project according to your requirements.

This book presents a step by step design approach to develop and implement an IoT system starting from sensor, interfacing to embedded processor, wireless communication, uploading measured data to cloud including data visualization along with machine learnings and artificial intelligence. The book will be extremely useful towards a hands-on approach of designing and fabricating an IoT system especially for upper undergraduate, master and

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PhD students, researchers, engineers and practitioners.

Automate your home or business with inexpensive Wi-Fi devices

ESP8266 Robotics Projects

Beginning Arduino Nano 33 IoT

IoT Projects with Arduino Nano 33 BLE Sense

Build Long Range, Low Power Wireless IoT Networks

Get started with the extremely versatile and powerful Arduino Nano 33 BLE Sense, a smart device based on

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the nRF52840 from Nordic semiconductors. This book introduces you to developing with the device. You'll learn how to access Arduino I/O such as analog and digital I/O, serial communication, SPI and I2C. The book also covers how to access sensor devices on Arduino Nano 33 BLE Sense, how to interact with other external devices over BLE, and build embedded Artificial Intelligence applications. Arduino Nano 33 BLE Sense consists of multiple built-in sensors such as 9-axis inertial, humidity, temperature, barometric, microphone, gesture, proximity, light color and light intensity sensors. With this book, you'll see how this

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board supports the Bluetooth Low Energy (BLE) network, enabling interactions with other devices over the network. What You'll Learn Prepare and set up Arduino Nano 33 BLE Sense board Operate Arduino Nano 33 BLE Sense board hardware and software Develop programs to access Arduino Nano 33 BLE Sense board I/O Build IoT programs with Arduino Nano 33 BLE Sense board Who This Book Is For Makers, developers, students, and professionals at any level interested in developing with the Arduino Nano 33 BLE Sense board.

IoT: Building Arduino-Based Projects

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Creative DIY Microcontroller Projects with TinyGo
and WebAssembly

Arduino Essentials

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

Experiments with Real-World Applications

JavaScript Robotics