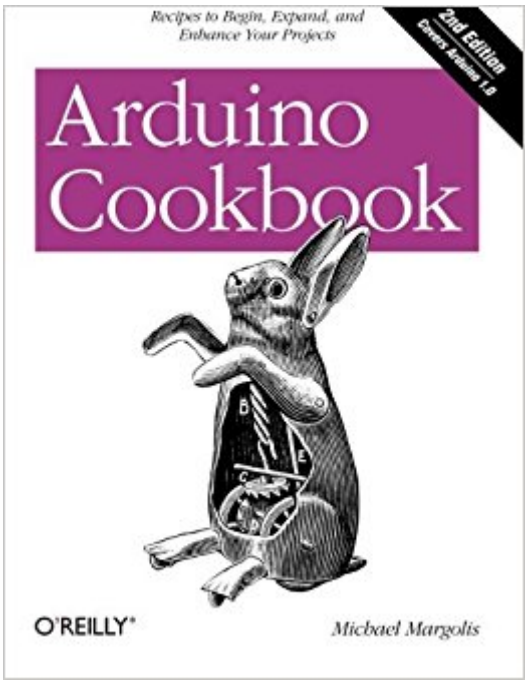
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Arduino Cookbook, 2nd Edition



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Synopsis

Want to create devices that interact with the physical world? This cookbook is perfect for anyone who wants to experiment with the popular Arduino microcontroller and programming environment. YouÃ¢â ¬â„¢ll find more than 200 tips and techniques for building a variety of objects and prototypes such as toys, detectors, robots, and interactive clothing that can sense and respond to touch, sound, position, heat, and light.You donÃ¢â ¬â„¢t need to have mastered Arduino or programming to get started. Updated for the Arduino 1.0 release, the recipes in this second edition include practical examples and guidance to help you begin, expand, and enhance your projects right awayÃ¢â ¬â •whether youÃ¢â ¬â„¢re an artist, designer, hobbyist, student, or engineer.Get up to speed on the Arduino board and essential software concepts quicklyLearn basic techniques for reading digital and analog signalsUse Arduino with a variety of popular input devices and sensorsDrive visual displays, generate sound, and control several types of motorsInteract with devices that use remote controls, including TVs and appliancesLearn techniques for handling time delays and time measurementApply advanced coding and memory handling techniques

Book Information

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Customer Reviews

Michael Margolis is a technologist in the field of real time computing with expertise in developing and delivering hardware and software for interacting with the environment. He has more than 30 years of experience at senior levels with Sony, Microsoft, and Lucent/Bell Labs. He has written

libraries and core software that are part of the official Arduino 1.0 distribution.

This book presents the broad landscape of what’s possible with Arduino. It is one of the few Arduino books available that have been updated for Arduino 1.0. Content is organized as "recipes", and you can combine them to do all kinds of things. Knowing what is possible should help to stimulate your imagination. The book does not go deep into any one subject, choosing instead to give you enough to get started, and pointers on where to go for deeper information.AUDIENCETwo kinds of skills are required (or developed) to build projects that use Arduino. One is working with electronics - gathering components, assembling them, and connecting them to the Arduino. The other is simple programming in C. If you have these skills but no experience with Arduino and want a quick start, this book will really help.Someone with little or no experience in these areas may be able to figure it out from Chapter 1 in particular, and reading the rest carefully. Absolute beginners may find it easier to start with an absolute beginners book. If you buy this book and find it is too deep, keep it, you can always get a simpler book, then come back when you’re ready.The book is not a complete introduction to programming or electronics. The author chose to go broad to introduce his audience to a wide range of possibilities, rather than go very deep on any of them, but there is enough info to make it work, and references to go deeper.CHANGES FROMÃ Â ARDUINO COOKBOOK FIRST EDITIONThe second edition has been updated to the Arduino 1.0 release. It is expanded to 724 pages, 62 more pages, and a few dollars less. Comparing the books side-by-side, the table of contents were nearly identical. The page numbers are different, owing to expanded text in the second edition, and a few new sections:Sending Messages Using Low-Cost TranceiversCommunicating with Bluetooth DevicesUpdating Third-Party Libraries for Arduino 1.0Uploading Sketches Using a ProgrammerReplacing the Arduino BootloaderReprogram the Uno to Emulate a Native USB Device...and an Appendix: Migrating to Arduino 1.0, which describes the changes you need to make to older code to work with Arduino 1.0.If you have the first edition, you may not need to get the second edition. You can download the new source code from the publisher’s Web site; you can google "Arduino Software Release Notes" for a list of changes, some of which will require minor changes to your code. The author says that a few newer hardware devices have replaced the ones described in the first edition, but less than one year passed between these two editions, so it would not be a lot. The change to Arduino 1.0 should not require changes to circuits.STRUCTUREThe book has 18 chapters containing a total of 204 topics or "Recipes" structured as a Problem, a Solution, Discussion, and See Also sections. Most problems are things people would really want to do: pieces of a project. Solutions consist of C code and

libraries, and electronic components. Discussion might be troubleshooting, variations, or more information. See Also provides references for more information - in the book, and URLs for Web-based information or libraries.The average "recipe" is 3.1 pages long; some are longer than others.CONTENTChapter 1 discusses the software development environment (which is supported for Windows, Mac, and Linux, but comes from Arduino) and very basic information about the board. In introduces simple programming and wiring by way of the common "blinking light" example. In 21 pages, the goal is to get something running quickly more than learning how it all works.Two chapters explain a bit about C: types of variables and manipulations; mathematical operations for numeric types.Programs must have input and/or output to be useful. Since this is what makes your solution come alive, this is the bulk of the book, and the most interesting part.Chapter 4 introduces serial communications - exchanging information with a computer which is connected to the Arduino via USB. This can be used for I/O to a connected computer, as well as debugging your program by sending status messages at various points in the processing.Chapter 5 discusses digital and analog input and output at a very basic level - controlling output to pins, and reading input from the pins. This is the foundation for all I/O that follows.A strength of Arduino is the vast array of devices that work without a lot of extra circuitry. Chapter 6 discusses detecting light (or dark), movement, acceleration, vibration, distance, sound, temperature, location, direction, and interface to a computer mouse or a game controller. Chapter 7 discusses visual output using LEDs alone or in a matrix, 7-segment displays, and meters.Chapter 8 discusses producing movement, vibration, or controlling external devices with relays and solenoids. Chapter 9 shows you how to make sounds - as tones, melodies, playing recordings, controlling a MIDI synthesizer, and making a simple audio synthesizer.Chapter 10 presents uses of InfraRed devices (your home stereo, your camera, etc) as well as detecting and acting upon InfraRed signals from remotes you already have. Chapter 11 tells you how to use LCD displays available for Arduino to display text, or how to display text on the TV.Chapter 12 deals with dates and times - make Arduino aware of passing time, or to work as an alarm clock.Chapter 13 presents I2C and SPI, standards used for exchanging information between a variety of digital devices. Learn to use a standard and you'll find it can be used with other devices. For example, if you want to use a Wii Nunchuck controller to control your Arduino applications, you will need to learn about I2C. You can also use I2C to talk to external memory added to Arduino, get temperature for an external digital temperature measuring device, or display 4 numbers on 7-segment displays using only two wires.Chapter 14 is about wireless communication. Chapter 15 discusses using an Ethernet shield to Internet-enable your Arduino application.Chapter 16 discusses the creation and use of code libraries. Chapter 17 dives deeper into the subject of

prgramming, especially in handling memory. Chapter 18 is all about using the controller chip hardware in ways not (yet) supported by libraries.Nine appendices give basic information on building with electronics, troubleshooting, digital and analog I/O pins, and character sets. For those who have code written prior to the release of Arduino 1.0, an appendix is there to help you migrate.The source code can be downloaded from the publisher's Web site; the URL is on page xv.ELECTRONIC VERSIONYou should seriously consider the PDF version of the book, because all of the many links are live, and the PDF is on your computer as handy reference. You can always print pages as needed for reference while building. O'Reilly currently has a good deal for upgrading to a new PDF edition.SUMMARYThe book serves as an introduction to the broadest range of Arduino capabilities of any book I have seen. With a little experience, the book will get you going quickly by demonstrating a working example that may be enough for your purposes. For me, this book is indispensable for Arduino work.

This is the first time that I have ever bought a book that did not leave me hanging. In the past, I have wasted so much money and time on books that only left me with more questions and frustration. After only several days of owning this book, I have solved so many Arduino and Xbee problems that were blocking me from any further progress on my many projects. I HIGHLY recommend this book to anyone who loves Arduino! I ordered his next book which is not out yet, but I am sure that I will be just as happy and impressed as I am with this book. :)

My experience with electronics peaked with changing light bulbs and the batteries in some flashlights. My programming skills topped out with Fortran and, years later, Visual Basic.The Arduino caught my eye one day while browsing the web so I got an Arduino Uno.First I read some of the basic Arduino books like "Getting Started with Arduino", "Programming Arduino: Getting Started with Sketches" and others. I made the LEDs blink, endlessly rotated a servo or two. Cool, now what?I got a copy of "Arduino Cookbook" and a whole new world opened up for me.I'm not sure where the other books are, probably on a bookshelf at home somewhere. But I always know where my dog-eared, highlighted copy of the Cookbook is. For every project I start to research it has become the first go-to source.My first two-wheeled robot with ultrasonic sensors to avoid obstacles morphed into a roving IR transmitter/receiver (causing my lovely bride no small amount of angst when the TV would suddenly and without apparent reason to change channels or seemingly turn itself off and on). Now there are two Arduino Unos that communicate over simple RF transmitters/receivers. I send commands from my laptop to the attached Uno connected through a

serial port and that Uno sends those commands via a 433mHz transmitter to the mobile Uno which acquires the move commands with its RF receiver and moves accordingly.Buy it, read it, browse through it and keep it close at hand. The Cookbook is the initial go-to for each project and a great source of thought stimulation for what kinds of things are possible.

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Printing, Arduino, and More! Make: Lego and Arduino Projects: Projects for extending MINDSTORMS NXT with open-source electronics

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