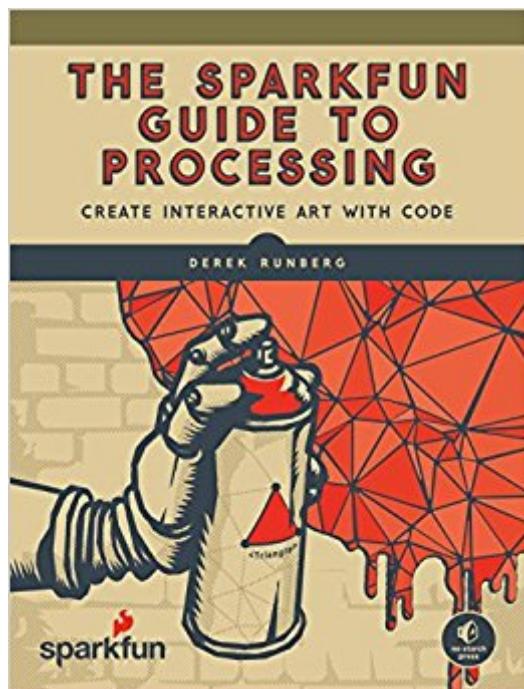


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# The SparkFun Guide To Processing: Create Interactive Art With Code



## Synopsis

Processing is a free, beginner-friendly programming language designed to help non-programmers create interactive art with code. The SparkFun Guide to Processing, the first in the SparkFun Electronics series, will show you how to craft digital artwork and even combine that artwork with hardware so that it reacts to the world around you. Start with the basics of programming and animation as you draw colorful shapes and make them bounce around the screen. Then move on to a series of hands-on, step-by-step projects that will show you how to: â€œMake detailed pixel art and scale it to epic proportionsâ€ â€œWrite a maze game and build a MaKey MaKey controller with fruit buttonsâ€ â€œPlay, record, and sample audio to create your own soundboardâ€ â€œFetch weather data from the Web and build a custom weather dashboardâ€ â€œCreate visualizations that change based on sound, light, and temperature readingsâ€ With a little imagination and Processing as your paintbrush, youâ€™ll be on your way to coding your own gallery of digital art in no time! Put on your artistâ€™s hat, and begin your DIY journey by learning some basic programming and making your first masterpiece with The SparkFun Guide to Processing. The code in this book is compatible with Processing 2 and Processing 3.

## Book Information

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## Customer Reviews

Derek Runberg works in the Department of Education at SparkFun Electronics, where he develops curriculum and materials for workshops and classrooms alike. Before joining SparkFun, Derek taught a middle school technology course centered on Processing and Arduino. SparkFun

Electronics is an online retail store that sells electronic parts for DIY projects. SparkFun is dedicated to making the world of electronics more accessible to the average person. In addition to selling products, SparkFun also offers classes and online tutorials through its Department of Education.

I've been through about the first quarter of the book. I'm an experienced Java developer, hacking Arduinos as a hobby, so it's tempting to skip rapidly over sections, but then little Processing-specific tidbits are thrown in when the general subject is, say, if statements. This book looks like a good, very gentle introduction to programming, and to Processing. I wanted to give some feedback to the publisher. The Kindle app on my Mac mangles the display of some of the code. Just after figure 3-2, for example, is a section called "Creating Walls", and there is a line that should be: `grow = grow * -1;` The minus sign shows up on top of the semicolon. There are workarounds to this: 1) Read the book somewhere else. It displays just fine on my Google tablet, for example, unlike many books that contain code. 2) Download the sample code. But just wanted to pass this on to the publisher. Will write a fuller review later.

Derek has created a great resource for the classroom teacher or "maker". I teach a digital art class to high schoolers. One of my goals is to encourage my art students to create interactive and kinetic artwork utilizing coding and robotics. This book is a GREAT resource for anyone who wants to explore these topics. It is written simply (good mix of technical descriptions and verbiage that is approachable to the complete beginner). This can be used as a text book that your students can work independently and develop their knowledge in their own way.

Once upon a time, far too many years ago to think about, I was a young nerd at school. I loved the sciences, but I also loved the arts and for a while that was fine. The trouble was once I hit that point where they start giving you careers talks I had to make a decision as to whether I was going to be an arts person or a sciences person. It was a strictly binary choice, no shades of grey allowed. I went the sciences route but I've always rather pined for the arts. Things are improving and now there's a burgeoning community of tech-artists who blend the best that art and digital tools have to offer and one of the digital tools finding favour is Processing. If Processing is new to you, it's an open source programming language and environment developed for use by designers and artists. It's used in both video arts and as a tool in producing interactive installations. The language itself is built on Java (though a much simplified version) and was used as a basis for the Arduino programming environment, so if you've used either of these you

will find it familiar. Whether it's completely new or not The Sparkfun Guide To Processing is well worth a look. The book is project driven and split into 14 chapters each with its own project, which gives you something to show at the end of each one. (You can download the code samples in the book via <https://www.nostarch.com/sparkfunprocessing> but I think that you get a better learning experience if you type it in and debug your errors, yourself.) The chapters follow the same structure: an introduction to the topic; an overview of the Processing concepts to be used; a walk through the project code and finally some pointers on how to extend the project. So far, so traditional. Where the book really shines is in its explanations of the conceptual underpinnings of the Processing language. I've used Processing a bit before and have some more in depth books on the language but this one clearly explains some of the underlying principles that I had failed to wrap my head around; there were more than a few eureka moments. I'm firmly of the opinion that you can do much more with a sound grounding in the principles of a language than just by knowing the syntax so this book really worked for me. Content-wise, you get a pretty thorough grounding in what you need to get started. The book starts with installation and drawing simple images before moving onto dynamic and interactive art. From there it moves onto slightly more complex areas such as working with text, processing images and manipulating video. Part of the utility of Processing is not just what it can do out of the box but also using the copious available libraries, working with external data sources and connecting it to other pieces of hardware. These are covered by projects using the Minim sound library, reading and using JSON format data and interfacing with Arduino. Of course no book is perfect and there are a few minor quibbles with The Sparkfun Guide To Processing. Firstly, and perhaps most importantly, there's a big strip across the back saying "Covers Processing 2"; Processing is now in version 3. In all fairness, the first full release of Processing 3 was after the book's release, but it has been in beta for a while now. This shouldn't be a problem as everything in the book seems to work with Processing 3; but it may put off some users who might think that they are buying an obsolete product. Secondly the coverage of object oriented programming is scant to the point of being non-existent. There is an excellent description of what classes and objects are but you never actually write either, which is missing a powerful part of the language. You don't actually need to write in an object oriented way to get things done in Processing but it does make things easier when you work with larger and more complex programs. Finally, some of the final chapter on hooking processing up to an Arduino is specific to a Sparkfun product (perhaps not unreasonably as this is The Sparkfun Guide To Processing) but I would have preferred to see it address the vanilla Arduino board. Quibbles aside, this is the best introduction to Processing I've seen. In fact I

may go as far as to say it's the best introduction to any programming language I've seen. It's clear, concise and engagingly written. If you're thinking about getting into digital art then this book definitely deserves a place on your bookshelf. In summary, all I can say is arty nerdy types rejoice; someone's got your back! Bravo for No Starch Press; bravo for Sparkfun and most of all bravo for Derek Runberg.

Processing has become an essential application for electronic visual artists. Providing image, text, sound and video manipulation, it can also animate and integrate with micro-controllers to create impressive interactive multi-media displays. Anyone familiar with Arduino will feel right at home the nanosecond Processing displays, because Arduino actually based its user interface and programming methodology on Processing. Though Processing does very different things than Arduino, the two share more similarities than differences. They even both use "sketches." The two can even talk to one another, which opens up staggering possibilities. But before any of that can happen, the frenetically eager need to learn Processing's functionality and language. One great resource for getting up to speed faster than hyperdrive is "The Sparkfun Guide To Processing" published by the always entertaining, always superbly designed and always informative No Starch Press. Anyone with any programming chops whatsoever will have absolutely no difficulty with this book. Those without programming experience will also encounter few problems, though it may take a little longer to learn and practice the concepts. Everything conceptual that anyone needs to program appears in this dense but highly readable book. It covers all of the basics such as variables, loops, decision logic, functions, calling web APIs and more. Thorough explanations accompany every concept along with enough examples to make the concepts stick. More than anything, the book is a ton of fun. Not to mention that the open source Processing application comes at absolutely zero cost. Nothing. Nil. Just download and open. One small caveat, Sparkfun does sell electronics. Bright shiny red ones of their own making. It should then come as no surprise that the book showcases their product line. A few projects do require extra purchases to obtain maximum satisfaction, but the book happily makes these optional, with the possible exception of the video and audio chapters and the final chapter. So what does this book cover? Seemingly everything. But first, those who have checked out Processing recently will notice that this book has aged a little bit and uses Processing version 2.2.1 rather than the most recent version 3. Don't dismiss this book based on our obsessive up to date culture where anything more than a nanosecond old becomes instantly obsolete. Relax. All of the examples run perfectly fine with Processing 3. Version 3 does look slightly different and also has new features, but it hasn't changed

anything beyond recognition or introduced any forward breaking changes. So all is well. The book does mention Processing 3 in chapter 11 in reference to its new audio library, but it doesn't derail anything. The book seeks to accommodate both version 2 and version 3. And it does. After a short introduction including download instructions for Windows, Mac and Linux Ubuntu, a tour of the IDE and some basic syntax, the book dives right into drawing pixels using rectangles, ellipses, lines and triangles. Soon these shapes move, follow logic and time sequences and become independent with matrices. Chapter 6 introduces image manipulation with filters and ends with a project that pays homage to Andy Warhol. Processing also has impressive text manipulation functionality. Pairing this with shapes, animation and mouse movements makes for very interesting effects. The projects soon start to get really fascinating and even aesthetically pleasing. Chapters 8 and 9 walk through creating a drawing program and an interactive maze game generator. This game even includes moving a small dot through the maze. The brave can add a Sparkfun MaKey MaKey controller (available on Sparkfun's website) and navigate through mazes by tapping on fruit. It does work. Then things move into the video realm and these projects require a webcam or some method to capture video. This section ends with the creation of a photo booth application. For sound manipulation, the book uses the Minim library for version 2 compatibility. It also demonstrates how to create an audio sampler that records and plays back sound. This of course requires a microphone. The book also covers importing JSON data into Processing using the free API at [openweathermap.org](http://openweathermap.org). This site has since required the use of API keys, so these examples need to include an extra parameter in the query string, such as "&APPID=". The site includes instructions. A final chapter demonstrates the integration of Processing with the popular Arduino micro-controller, though it uses the Sparkfun "Digital Sandbox" tool rather than a standard Arduino. This tool comes with an Arduino processor baked in and pre-wired components such as LEDs and numerous sensors. It also comes at a somewhat hefty price. Those who already possess an Arduino and wiring skills can skip this tool and just wire things up on their own. Those lacking such skills or materials will likely have difficulty completing this chapter without the Digital Sandbox. Nonetheless, this section provides a great example of the two programs interacting. It also points towards many intriguing possibilities for projects, multi-media displays and any other creations lurking within creative brains. "The Sparkfun Guide To Processing" clearly demonstrates the impressive possibilities of this free program. It also provides fun and inspiring examples that will leave the ambitious wanting more. Best of all, the examples work. After completing this book one will start seeing Processing everywhere. Art galleries use it. Public art displays use it. Many multi-media displays likely use it. It has definitely found a niche. The Processing website also includes a

supportive community that can answer questions or help troubleshoot problems. Not to mention the video tutorials and voluminous resources to help take the knowledge acquired in this book to the next level. Many will find themselves instant Processing addicts. Some addictions are good.

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