SparkFun Joystick Shield

For the Arduino Uno

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Introduction

AVR microcontrollers were originally introduced by Atmel (now owned by Microchip Technology) in 1996. This family of microcontrollers was special at the time of release because they used flash memory on the chip to store program data rather than older EEPROM standards.

AVR chips are found in an almost-endless list of different embedded devices at the industry level, but Arduino brought AVR to hobbyists and educators. Arduino provides a low cost-of-entry family of microcontrollers to their customers as well as free tutorials and a powerful IDE.

The Arduino Uno

The controller given to our group was the Arduino Uno. Below are some relevant technical details.

Microcontroller	ATmega328P
Operating Voltage	5V
Analog Input Pins	6
Digital I/O Ports	14 Total; 6 with Pulse Width Modulation
Flash Memory	32 KB on chip with 0.5 KB reserved for the bootloader
Clock Speed	16 Mhz

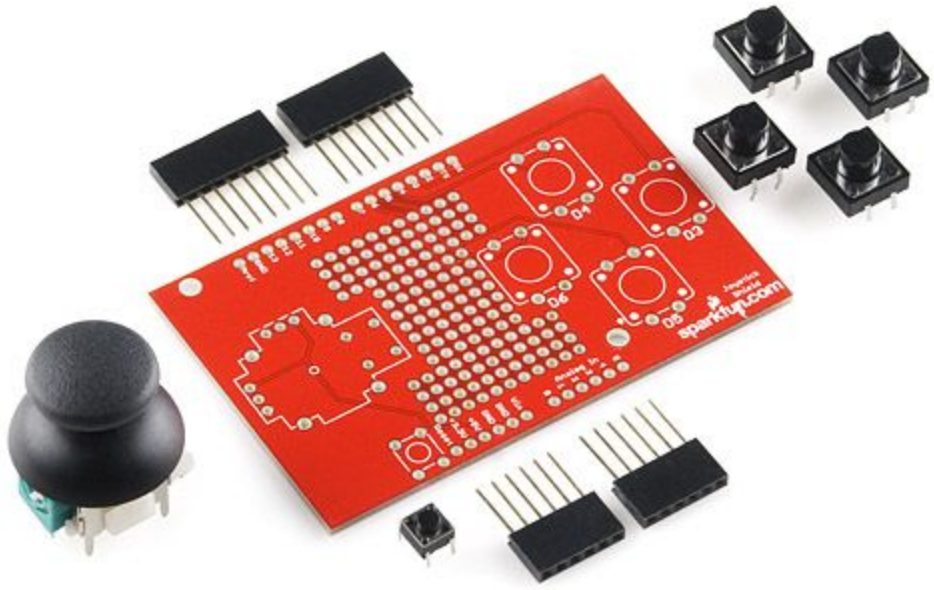
The Uno's USB port can both provide enough power to run the controller and be used to write new program data to the flash memory quickly.

The Joystick Shield

SparkFun Electronics sells a series of different “shield” devices. Shields are secondary (or tertiary, if you’re brave enough to keep stacking) printed circuit boards (PCB) that can be easily slotted into the top of your Uno board.

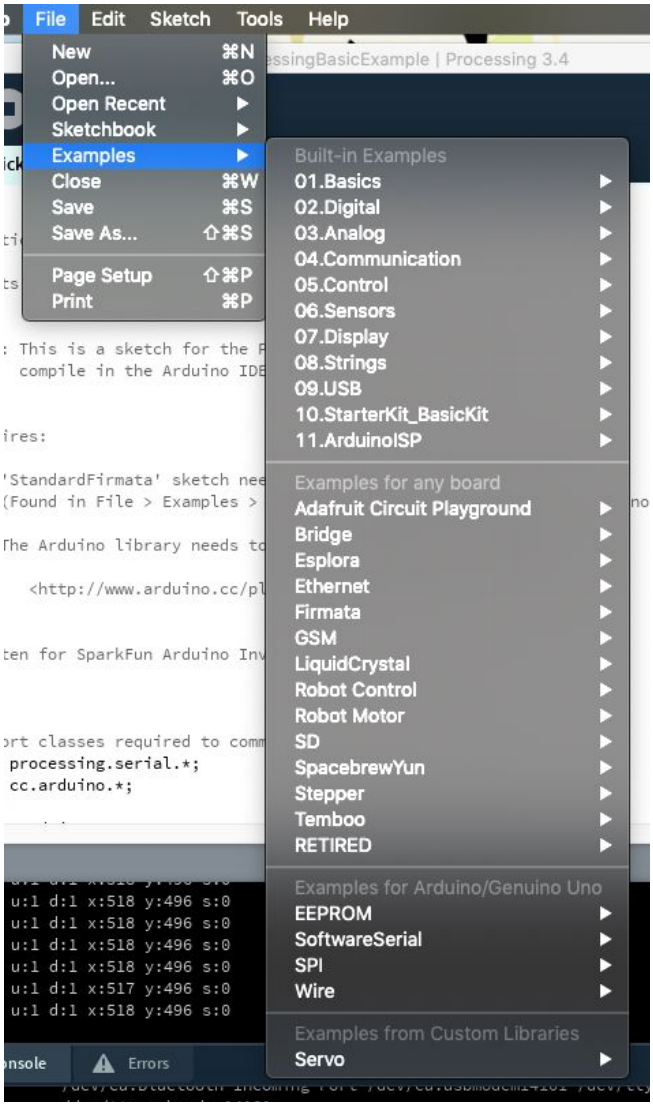
The Joystick Shield comes with an analog thumbstick and six buttons. The thumbstick uses two analog ports (0 and 1) to report its position data. The stick has two potentiometers, oriented perpendicularly, each reporting a value between 0 and 1023. These two values can be used as X and Y positions on a coordinate plane to visualize the range of motion.

The four large, obvious buttons each report to a digital pin. They range over from ports 3 to 6. The thumbstick can be pushed down to click a fifth input button connected to digital port 2. The final button included in the kit is a reset button. This is a smart idea as larger shields might cover the entirety of the Uno.



Development Tools

The most simple option for starting AVR development is the Arduino IDE. This program allows coding in C through the use of numerous libraries. These libraries range from simple to complex and the IDE comes with dozens of example files to help.



The Arduino IDE was written in Java and based on Processing. Processing is a self-described “software sketchbook” with the goal of creating interdisciplinary works between visual artists and programmers.