

# FLEXWEST, LLC - Demonstrations Prescott Regional SciTechFest (March 2019)

## Microcontrollers, learn to program hardware

### **BBC Micro:Bit**

\$17 microcontroller. Great introduction to programming hardware devices. Easy to load your program from a PC via a USB cable. Many programming languages and tools: Micro Python, C/C++, Graphical Blocks / Javascript

### **Raspberry Pi**

\$35 Raspberry Pi 3B+, credit card sized Quad Core Linux computer. Can be used for many applications, runs a full Linux OS, many open source programs. We are demonstrating it with a camera and computer vision. Also: \$5 Raspberry Pi Zero, \$10 Raspberry Pi Zero W

### **Arduino**

\$20 for genuine boards from Arduino; clones are available for less than \$10. Open source hardware. Typically programmed in C/C++. Many libraries and applications are available. We are showing the Arduino "Leonardo".

### **STM32 "Blue Pill" STM32F103C8T6**

\$2 development board, based on the STM STM32F103C8T6 microcontroller. Very powerful for the price. (Not recommended as your first microcontroller).

## Robotics

Simple line following robot: WHDTS Smart Car Soldering Project Kit (\$10 at Amazon.com)

Machine Vision : Open Computer Vision (OpenCV)

The impact of automation and robotics on employment (videos and discussion)

## Linux operating system

Free and open source software you can run on most computers. For many people, Linux can be used as your everyday "desktop" computer. Most Internet web sites run Linux. Linux is the foundation of the Google Android smart phone software.

NOTE: We don't sell these things, these are just demonstrations to get you interested.

(More details on where to buy or get them are on the reverse side)

## BBC Micro:Bit

- <https://microbit.org/>  
Main web site for the Micro:Bit, tutorials, where to buy, lots of information.
- Micro:Bit Go  
Usually \$16.99, includes board, USB cable and battery box.  
Some vendors: frys.com, adafruit.com, sparkfun.com, amazon.com

## Arduino

- <https://arduino.cc>  
Main web site for Arduino; tutorials, software downloads, lots of information
- Arduino Uno R3, \$22.00, Leonardo \$18, many other models. Open source, and many clones are available on eBay for under \$10.

## Raspberry Pi

- <https://www.raspberrypi.org>

## STM32 “Blue Pill”

- Commonly available on eBay for around \$2 shipped. Search for “STM32F103C8T6 development board”. Usually, you will need a programming device, e.g. search for “st-link v2” on eBay.

## OpenCV

- <https://opencv.org/>

## LINUX

- Many different versions (“distributions”) are available. At FLEXWEST, we typically use Xubuntu, Debian and Raspbian. There are many ways to run Linux concurrently with other systems such as Microsoft Windows or MacOS. You can install Linux onto a USB flash drive and run it without disturbing your existing PC OS installation.
  - <https://xubuntu.org> - The distribution used most at FLEXWEST
  - <https://www.ubuntu.com>- One of the most popular Linux distributions

## About FLEXWEST, LLC:

FLEXWEST provides engineering services, including embedded system development, industrial automation and robotics, prototype and short run CNC machining. If you have a product or invention, and need help, give us a call.

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Automation is impacting employment and other aspects of society. These issues are not receiving enough attention. We offer a presentation, “Robotics and our Changing Society”, free of charge for your non-profit organization or group:

<https://flexwest.com/robotsAutomationAndOurChangingSocietySeminar.html>

Links related to the presentation are here:

<https://flexwest.com/robotsAndOurChangingSociety.html>