Microcontrollers

Microcontrollers are small computers that can easily be interfaced to real-world sensors and effectors. They are inexpensive and easy to program, making them ideal for a variety of *maker* projects.

- Arduino: $25, credit-card size. Easy to plug in to. *Shields* plug in for capabilities such as internet.

- Arduino Pro Mini: $10 ($2 on eBay). Thumb-size, requires soldering.

- Flora: $20. Wearable Arduino, designed to be sewn into garments.

- Teensy: $20. Thumb-size, requires soldering. More powerful processor than Arduino.

- Raspberry Pi: $35. Runs Debian Linux. Uses TV for display, SD card hard drive. Desktop system costs $80 plus a TV. Pi Zero W is $10.

- Starter Kits: $80 - $100. Includes a processor board, plugboard, wires, components, book of projects.

- Sensors: buttons, pots (potentiometers or volume controls), light, sound, temperature, tilt, motion, GPS, touch, muscle, camera, joystick, etc.

- Effectors: lights, motors, relays, sound, displays.

Arduino Programming

Arduino is programmed in C on a laptop:

```
/*  Blink
    Turns on LED for 1 second, then off, repeat.
    LED is attached to digital pin 13.
    by Scott Fitzgerald
 */


// setup function runs once on power up
void setup() {
  // initialize digital pin 13 as an output.
  pinMode(13, OUTPUT);
}


// the loop function runs repeatedly forever
void loop() {
  digitalWrite(13, HIGH);   // turn the LED on
  delay(1000);              // wait 1 second
  digitalWrite(13, LOW);    // turn the LED off
  delay(1000);              // wait 1 second
}
```

Resources

- `www.arduino.org`

- `www.raspberrypi.org`

- `www.sparkfun.com`

- `www.adafruit.com`

- `www.seeedstudio.com` `fritzing.org`

- `www.element14.com`

- `www.mcmelectronics.com`

- `www.alliedelec.com` `www.mouser.com`

- `austinmakerfaire.com` `makerfaire.com` `makezine.com`

- `amazon.com`, `ebay.com`, the usual suspects.

UT Foundry

UT Foundry, `http://www.lib.utexas.edu/foundry`, is located in the Library area on the 3rd floor of DFA, the Doty Fine Arts building (the building between the Art building and Performing Arts Center on 23rd). The Foundry and its equipment can be used for free by any UT student for projects of personal interest.

To qualify to use the equipment, sign up for a Canvas on-line course at:
`https://utexas.instructure.com/enroll/AL4PBN`

- 3-D printers

- Laser cutter

- Multi-axis milling machines

- Laser Scanner: make a 3-D model of scanned object

- Tools

- Sewing machines and large-format printer and pattern cutter

- Video Wall

- Gaming and Virtual Reality studio

- Recording Studio