Robotics Club University

Originally Presented 2/18/2015 by Nick McComb

Oregon State University Robotics Club
groups.engr.oregonstate.edu/osurc

Agenda

- Hardware Overview
- Software Overview
- Example Sketch

My Background

What is Arduino?

- Hardware **and** Software
  - Open-source microcontroller board
  - Arduino Libraries
- Rapid Prototyping System

What is a Microcontroller?

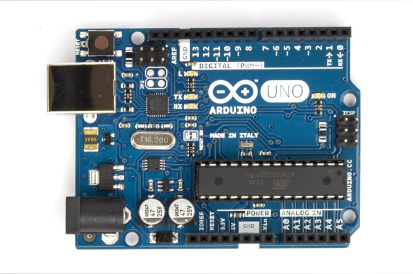
- µC, uC, MCU
- Single-solution contained in a chip
  - RAM, CPU, ROM, etc.
- Embedded Systems
- Lower-Level
  - No OS
  - “Realtime Execution”

What is a an Arduino?

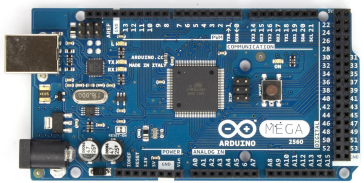
- Open Source Microcontroller Platform

Arduinos

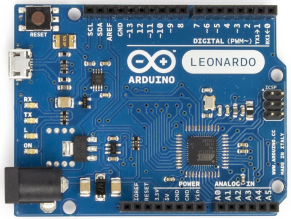
UNO



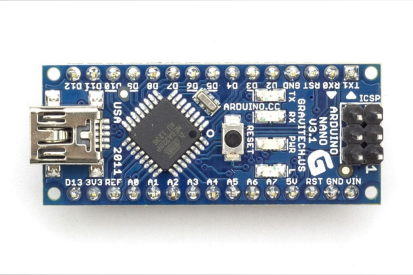
MEGA



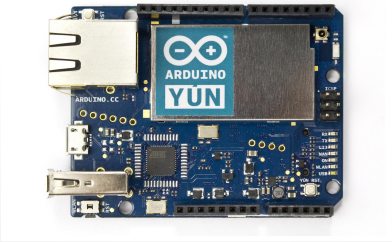
Leonardo



Nano



Yun



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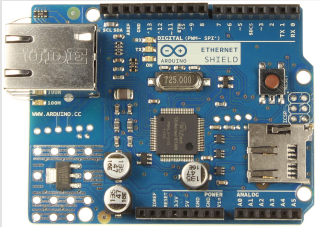
Arduino Shields

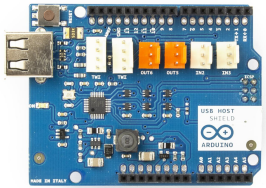
- Plugs into top of Arduino
- Eases hardware development

Arduino Shields

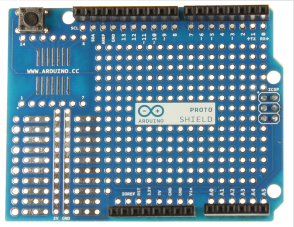
Ethernet



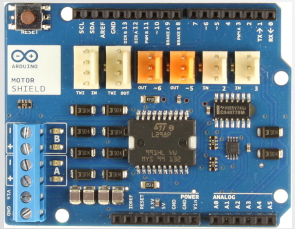
USB Host



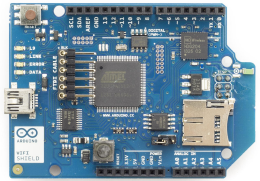
Proto Shield



Motor Shield



Wifi Shield



Arduino Libraries

- Eases Embedded Programming
- Makes common functions easier
  - Ethernet
  - LiquidCrystal (LCD Screens)
  - SD Card
  - Servo
  - SPI / I2C
  - WiFi
  - Stepper
  - Etc...

What can I use an Arduino for?

- Basic Purpose: Low-level I/O
- Interacting with a computer
  - Example: Rover
- Complete Systems
  - Example: Christmas Lights

More Examples

- Wireless Chess
- Robot - Similar to ORK
- Balancing Robot

Arduino Programming

- Sketches
- Arduino IDE vs. Conventional IDE
- C++

“Arduino C++”

- Major Differences between C++
  - Prototypes
  - Class Types
  - Includes

Blink Sketch Demo

Homework

http://www.learncpp.com/

Make More Robot!