Arduino Use and Applications

An introduction to the Arduino Platform

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We made this in 20 minutes
Arduino Use and Application

- Arduino hardware and software introduction
- Basic hardware and electrical terms
- Connecting the Arduino
- Programming the Arduino
- Arduino shields and interaction
  - 'Talking' to the arduino
  - What is a shield and how to use it
  - 'reading' a sensor
- Autonomous operation
- Arduino wired and wireless networking
Arduino hardware and software introduction

What is an 'Arduino'?

What does it do?

What do you do with it?
Arduino hardware and software introduction

Basic hardware and electrical terms
- what are volts?
- What is 'zero'
- What is the difference between analog and digital
- What is a 'port'

![Diagram showing analog and digital signals](image)
Arduino hardware and software introduction

Connecting the Arduino
- How to connect the programming cable
- How to connect to individual input and output pins
Arduino hardware and software introduction

Programming the Arduino
- Where do you get code?
- What 'language' is the code in?
- What happens when you hit 'go'

void setup() {
    // put your setup code here, to run once:
    Serial.begin(9600);
}

void loop() {
    // read the input on analog pin 0:
    int sensorValue = analogRead(A0);
    // Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V):
    float voltage = sensorValue * (5.0 / 1023.0);
    // print out the value you read:
    Serial.println(voltage);
}
Session 1 Interactive period

Interactive Task!
Connect to an Arduino and blink a light

Extra Credit!
Connect a button (or pair of wires) to the Arduino and use those to control the light!
Arduino shields and interaction

'Talking' to the arduino
- How do other things communicate with a basic arduino?
Arduino shields and interaction

- What is a shield and how do you use it?
- What kinds of shields are available?
Session 2 Interactive Period

Main Task:
Create or modify the Simple Serial code to customize controls, etc.!

Extra Credit!
'Read' the value from a sensor or shield and display the data in the terminal window
Advanced Arduino use

- Autonomous operation
- Arduino wired and wireless networking
- Low power operation
- Equipment Control