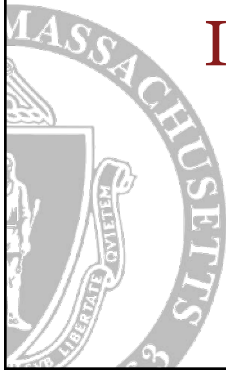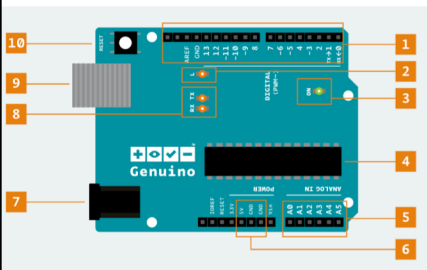# UMassAmherst

Embedded Systems
Intro to the Arduino

Laboratory for Perceptual Robotics – Department of Computer Science

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UMassAmherst

Arduino Uno – www.arduino.cc > Learning > Getting started

1. Digital pins - Use these pins with digitalRead(), digitalWrite(), and analogWrite(). analogWrite() works only on the pins with the PWM symbol.
2. Pin 13 LED - The only actuator built-in to your board. Besides being a handy target for your first blink sketch, this LED is very useful for debugging.
3. Power LED - Indicates that your Genuino is receiving power. Useful for debugging.
4. ATmega microcontroller - The heart of your board.
5. Analog in - Use these pins with analogRead().
6. GND and 5V pins - Use these pins to provide +5V power and ground to your circuits.
7. Power connector - This is how you power your Genuino when it's not plugged into a USB port for power. Can accept voltages between 7-12V.
8. TX and RX LEDs - These LEDs indicate communication between your Genuino and your computer. Expect them to flicker rapidly during sketch upload as well as during serial communication. Useful for debugging.
9. USB port - Used for powering your Genuino Uno, uploading your sketches to your Genuino, and for communicating with your Genuino sketch (via Serial.println() etc.).
10. Reset button - Resets the microcontroller.

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Arduino programming language
(https://www.arduino.cc/en/Reference/HomePage)
structure, variables, functions

Arduino Software IDE
(https://www.arduino.cc/en/Main/Software)

Libraries - New Cores - Foundations
(https://www.arduino.cc/en/Tutorial/Foundations)

Uploading Code

- Connect the USB cable from your computer to the Arduino.

- Choose Tools>Board>Arduino Uno to find your board in the Arduino menu. You can also find all boards through this menu, such as the Arduino MEGA 2560 and Arduino Leonardo.

- Choose Tools>Port to select the correct serial port for your board. You find a list of all the available serial ports by choosing Tools>Serial Port> comX or /dev/tty.usbmodemXXXXX. X marks a sequentially or randomly assigned number.

    - **In Windows:** the COM port will normally be the highest number, such as com 3 or com 15. Many devices can be listed on the COM port list.

    - **On Mac OS X**, the /dev/tty.usbmodem number will be randomly assigned and can vary in length, such as /dev/tty.usbmodem1421 or /dev/tty.usbmodem262471.

- Click the Upload button. This is the button that points to the right in the Arduino environment.

Pololu Dual MC33926 Motor Driver Shield

https://www.pololu.com/product/2503

under the "Resources" tab it lists the
Arduino library for the Pololu Dual MC33926
Motor Shield Driver

https://github.com/pololu/dual-mc33926-
motor-shield It includes a demo program
that ramps both motors