Manipulating a 3D Object with Arduino and Processing

By Julia Makivic

About me

- Wellesley 2015, majored in Media Arts and Sciences
- Worked as web designer/developer after college
- MFA in Computational Arts at Goldsmiths University
- Creative Technologist
- Teaching Physical Computing at UAL

My Projects

- Alt-ctrl games using Arduino and Raspberry Pi
- Working with an artisan leather crafter to create "smart" purses
- Working with an indie games company to create a gesture based controller

Void of Memory

Ghostboi in the Land of the Dead

https://www.youtube.com/watch?v=CKJWw5DyMUo

What we will be doing today

- Manipulating a 3D model using Processing code
- Using data from an Arduino to manipulate the 3D model

Processing

- A coding language for visual artists
  - Beginner friendly
  - Built on top of Java
  - Manipulate images using code
- P5.js is a JavaScript framework based off of Processing
  - Meant for web-based projects
  - Learn more here: https://p5js.org/

Download and Install Processing

Download from this link: https://processing.org/download/

Arduino

- Open source platform for programming electronics
- Used to make interactive projects
- Built on top of C++

Download and Install Arduino

- Download Arduino over here: https://www.arduino.cc/en/Main/Software

Time to Code!

You can find all of the code for this tutorial here:
https://github.com/jmakivic/arduino3D

Download the data for the 3D model

- Download the 3D model from here: https://github.com/jmakivic/arduino3D/blob/master/doggo.obj

Displaying an Object in Processing

- Display and rotate low-poly model of a dog in Processing
- Manipulating the colors of the model
- Use Doggo_Orig.pde
- Link:
  https://github.com/jmakivic/arduino3D/blob/master/Doggo_Orig.pde

Changing the Model into a Different Shape

- Change the location of the each of the model's vertices
- Make the model change shape over time
- Link: https://github.com/jmakivic/arduino3D/blob/master/Doggo_Simple.pde

Changing the Model into a Different Shape Part 2

- Make 3D model change to a different shape and back again
- Use Doggo_Math.pde
- Link here: https://github.com/jmakivic/arduino3D/blob/master/Doggo_Math.pde

Processing 3D Model Tutorial

Tutorial for this lesson taken and modified from here:
https://medium.com/@behreajj/3d-models-in-processing-7d968a7cede5

Manipulating the 3D Model Using Arduino and an Ultrasonic Sensor

- Use data from an ultrasonic sensor to alter the shape of the 3D model
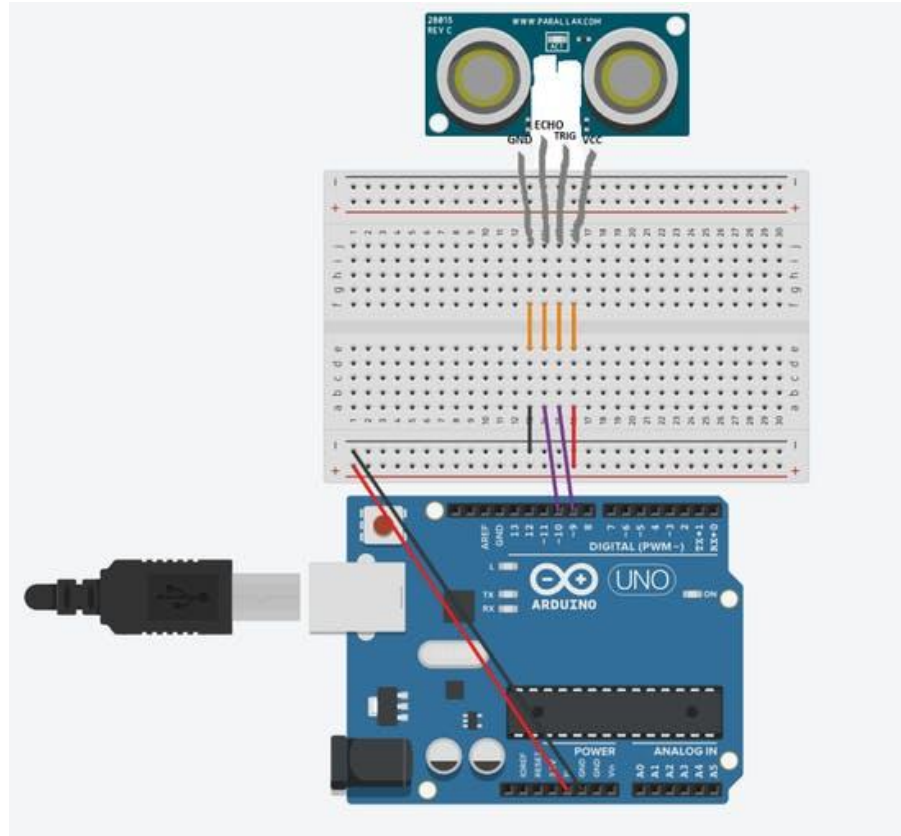
Components

- Arduino Uno

Components

- HC-SR04 Ultrasonic Sensor
- View full example here: https://create.arduino.cc/projecthub/Isaac100/getting-started-with-the-hc-sr04-ultrasonic-sensor-036380

Schematic with Distance Sensor

Arduino Code

Link to download and install Arduino:
https://www.arduino.cc/en/Main/Software

Arduino code:
https://github.com/jmakivic/arduino3D/blob/master/Ultrasonic
Processing.ino

Reach out to me!

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Questions?