

# **Motor/Sorting Sub-Team**

**Abdul - Gideon - Jathin - Hunter - Will - Thien**



# Who's Who?

HUNTER



Fun Fact: Did fencing for 3 years  
Year: Freshmen  
Major: Computer Engineering

ABDUL



Fun Fact: I have been playing cricket for 10+ years  
Year: Sophomore  
Major: Computer Science

GIDEON



Fun Fact: alpaca enjoyer  
Year: Sophomore  
Major: Computer Science

# Who's Who?

JATHIN

WILL

THIEN



Fun Fact: prefers Qdoba over Chipotle  
Year: 2nd  
Major: Computer Science



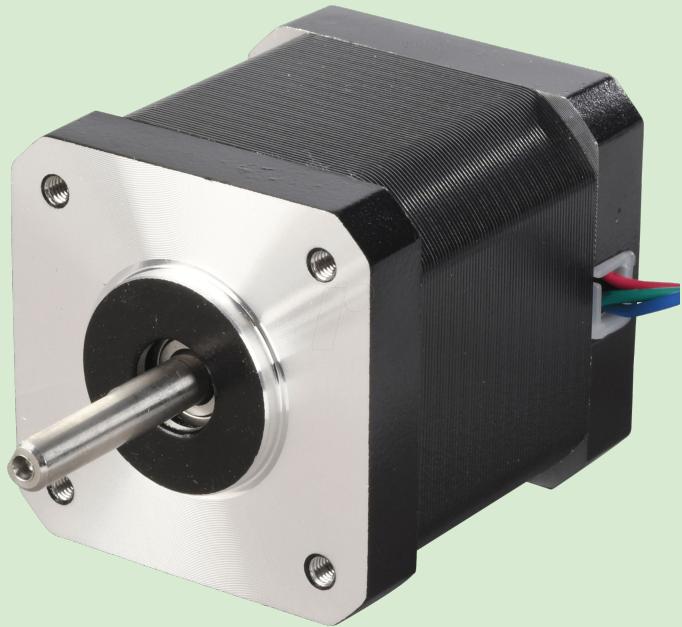
Fun Fact: a Taekwondo black belt  
Year: Freshman  
Major: Electrical Engineering



Fun Fact: Sprained ankles over ten times  
Year: Freshman  
Major: Computer Science

# Our Goals & Purpose:

- Goals:
  - Setting up Raspberry Pi and its power source
  - Configuring Raspberry Pi to make sure it is fully functional with our stepper motor
  - Writing code for the motors to make sure they run in their proper direction.
- Purposes:
  - Motors that we programmed are used to make sure the conveyor belt rotates so that the item is moved in the right bin



# Research Phase:

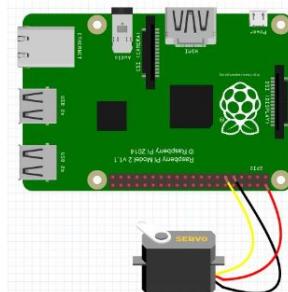
Steps towards our research

1. Finding correct Raspberry Pi and motor
2. Learning Raspberry Pi
3. Learning how to connect Pi to the stepper motor
4. Learning how to solder
5. Finding the correct code for the stepper motor
6. Configuring the code to serve our purpose
7. Overcoming any challenges faced throughout these processes

Tutorial Link: <http://youmii.be/SGwkh1MIVXUs>  
Large Servo motors:  
<http://www.dexterindustries.com/store/servo-motor-for-raspberry-pi-set-of-2-large/>

What is a servo?

- The motor that allows for precise control on its movement based on the instructions provided through coding.
- Servo are controlled using PWM signals

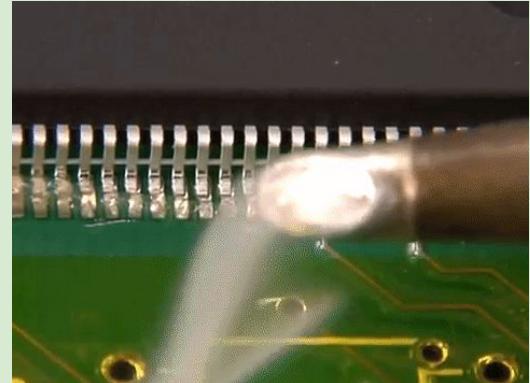


Beware: Check the specs of the servo and make sure it does not take more power than the raspberry pi device can handle. Otherwise it could damage it.  
The servo  
Instructions:

Servo's Are controlled Using PWM Signals, which you learned in LESSON 27.  
Servo's like to see a 50 Hz Control Signal  
The position of the Servo depends on the Pulse Width of the "On" Part of the cycle  
Most Servos are fully left with around a 1 msec pulsewidth

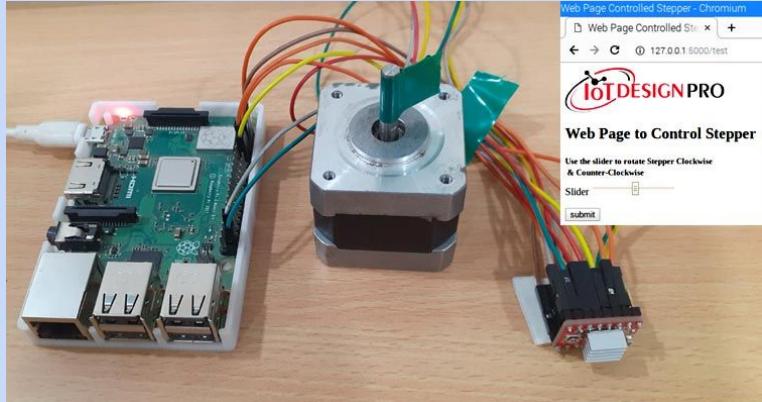
# Soldering

- Soldering is the process of joining two compounds by melting solder
- Process of soldering was used to connect parts of the raspberry pi
- Applied to the motor HAT to connect it to the raspberry pi



# Wiring & Circuits:

- Learned how to figure out the orientation of the wiring when connecting motors to a stepper hat.
- Learned how to figure out the orientation of the wires supplying power to the stepper hat.
- Learned how to connect and use the camera with the pi and stepper hat.
- Learned how to import the libraries and where to use them and how to use them to control the motors according to the output that is given by the camera code.



# Motor Code

- The main task with the code was to find the correct code for the driver, which just came down to finding the right library and looking through the documentation
- After finding the right library to import, it was essentially copy and paste
- Example code to turn the motor:

```
from adafruit_motorkit import MotorKit
from adafruit_motor import stepper
kit = MotorKit()

while True:
    kit.stepper1.onestep()
```



# Any Questions?

Here's a QR to these slides:



& Here's our contact info:

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