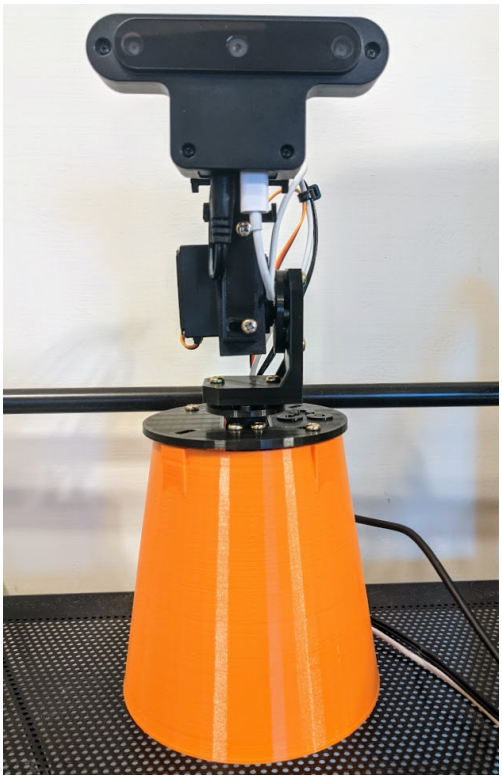
Tiff(AI)ny: An open source tracking camera built for the OpenCV OAK



How to Build an Object Pose Detection with an OpenCV camera?

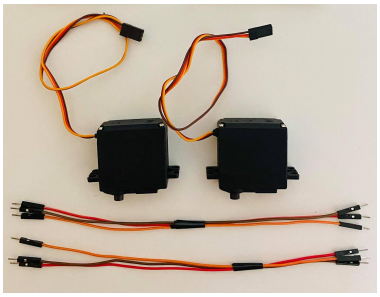
For this project, we are going to show you how to create an Object Pose detection using an OpenCV camera, two servo motors, and an Arduino board. The device will move itself around to follow the tracked and detected object.
Note: Other items such as USB cables, screws, bolts, and connectors will also be required to complete the build.

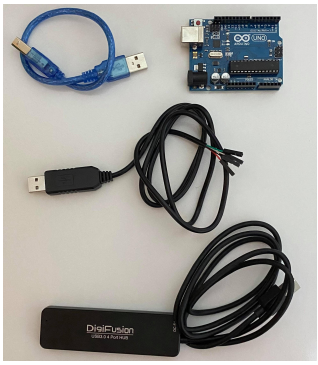
Step 1: Assembling the first Servo-motor
Step 2: Assembling second Servo-motor
Step 3: Connecting the wires to the Arduino board
Step 4: Mount the OpenCV camera on the device
Step 5: Upload the code to the Arduino board

Note: We highly recommend that you have a screwdriver or a small tool box when putting this device together.

List of Items

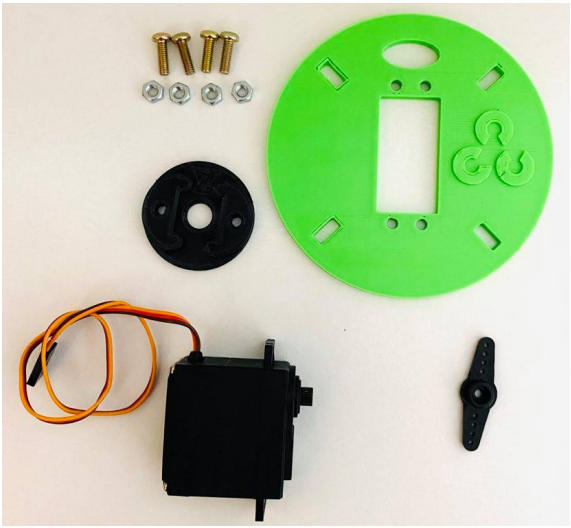
1 x Arduino Board
1 x OpenCV Camera kit
2 x Servo-Motors (MG-995 or better)
1 x Breadboard (smaller is better)
20 x m4 x 12 screws
4 x m4 nuts
8 x male-to-male connector wires
2 x Zip Ties





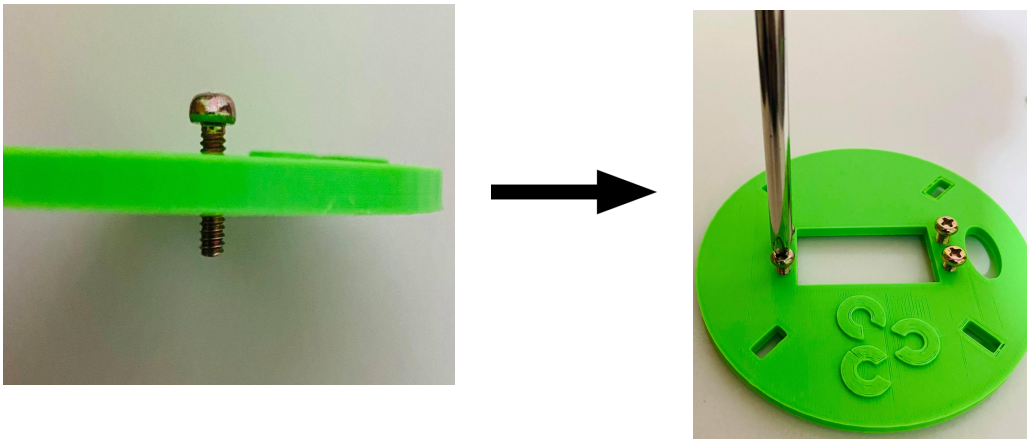
Assembling the First Servo-Motor

The parts needed for assembling the first servo-motor are shown in the diagram below.



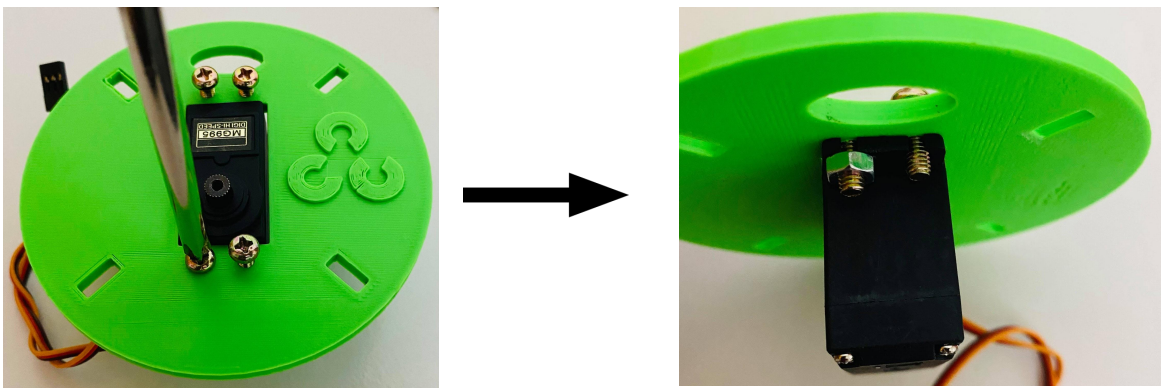
Step 1

Determine the inner and outside of the plastic cover. Install the screws into the plastic cover.

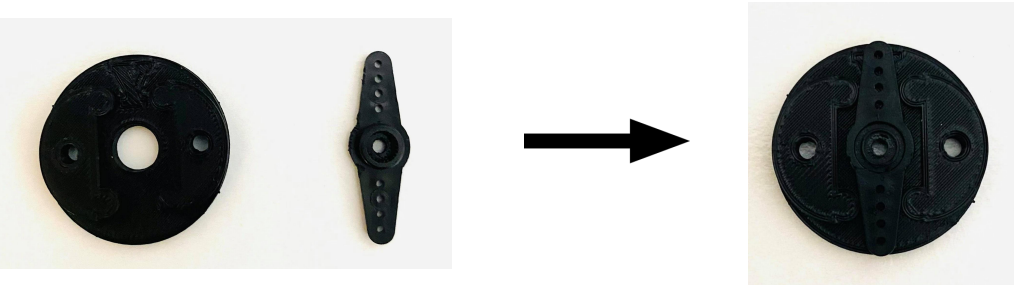


Step 2

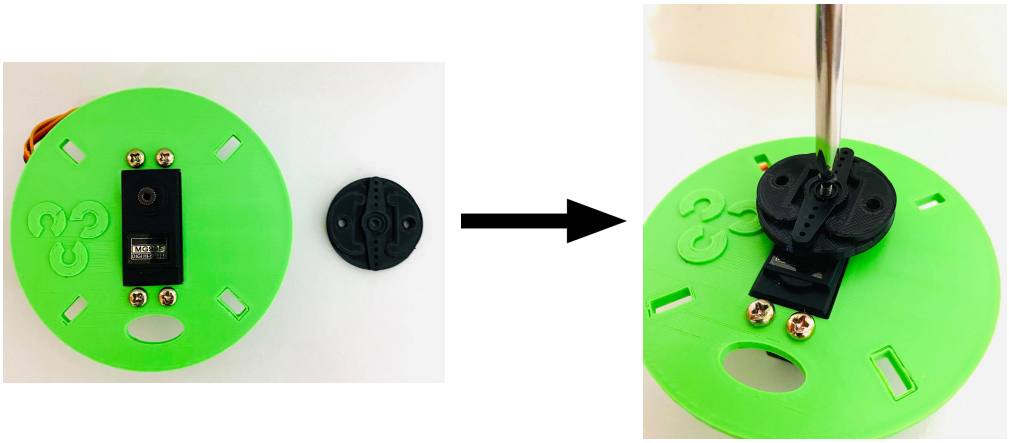
Insert the first servo-motor into the opening on the plastic cover and gently tighten with a screwdriver. Next, secure the servo-motor with the nuts.



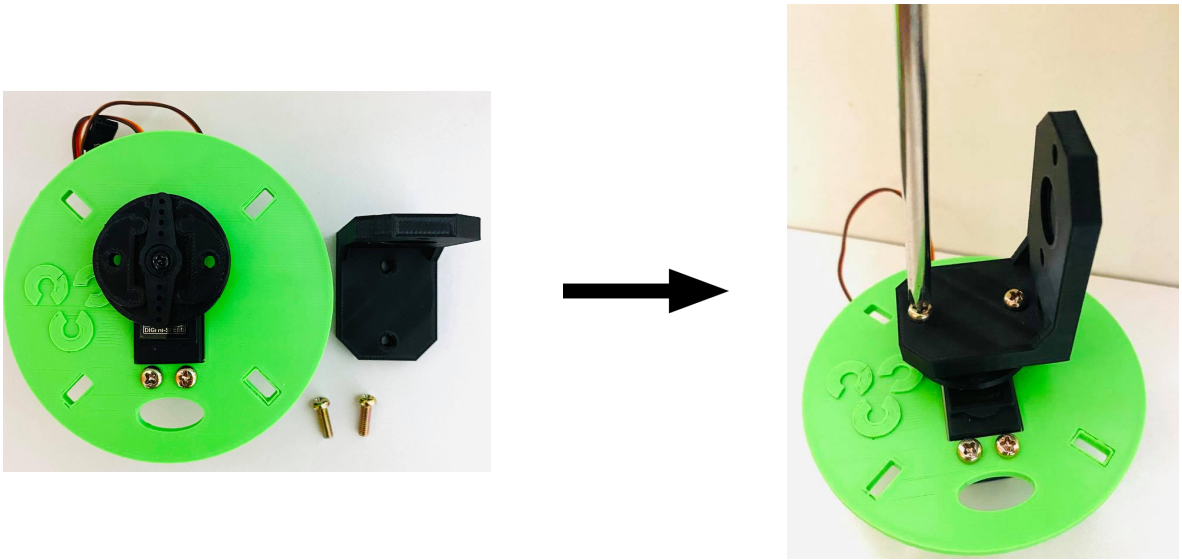
Step 3
Fix the servo-motor wing with the plastic lock.



Step 4
Attach the plastic lock onto the servo motor and gently secure it with the black screw that's in the servo-motor package.

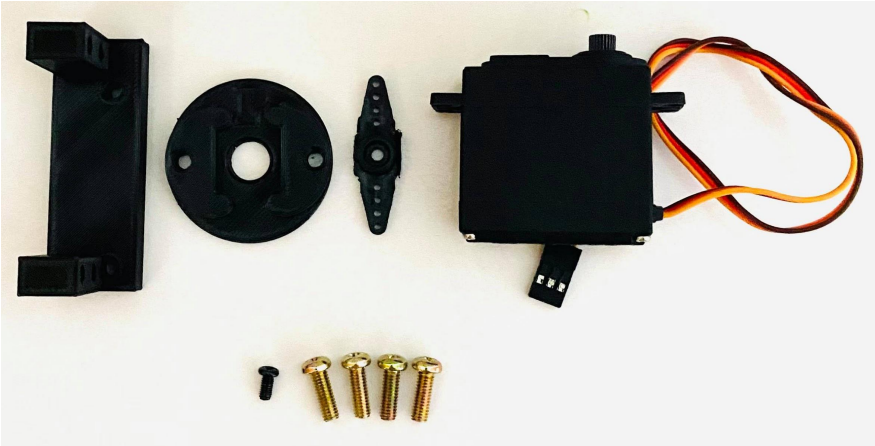


Step 5
Securing the L-shaped bracket that holds the second motor. Then, with a screwdriver, gently tighten the two screws.



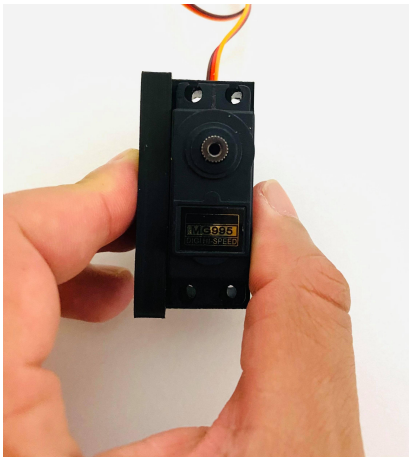
Assembling the Second Servo-Motor

The parts needed for assembling the second servo-motor are shown in the diagram below.



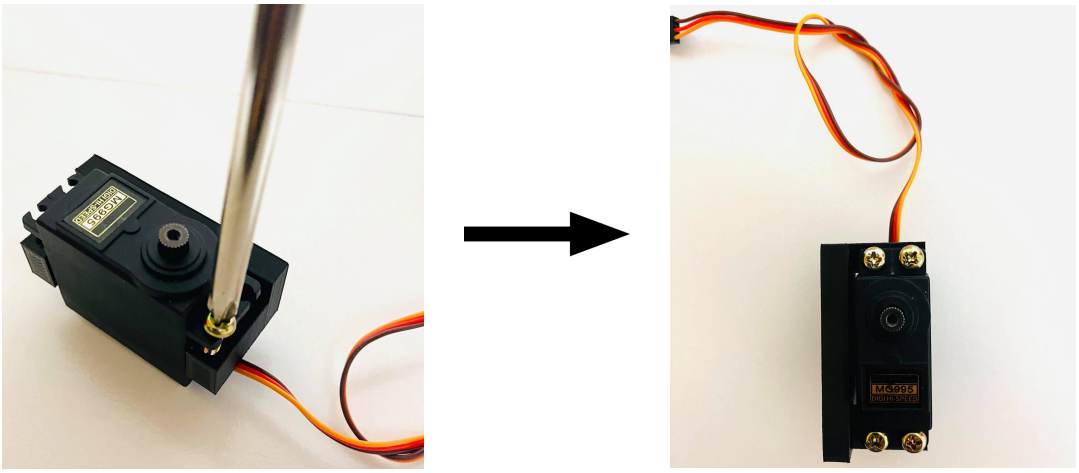
Step 1

Using your hands, gently attach the servo-motor bracket in the manner shown below.



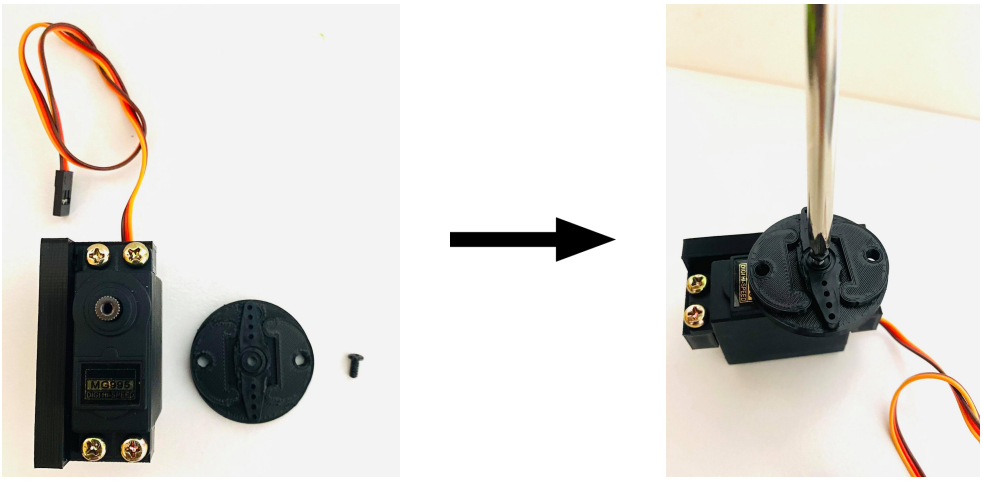
Step 2

The bracket should be securely fastened using the four screws as shown below.



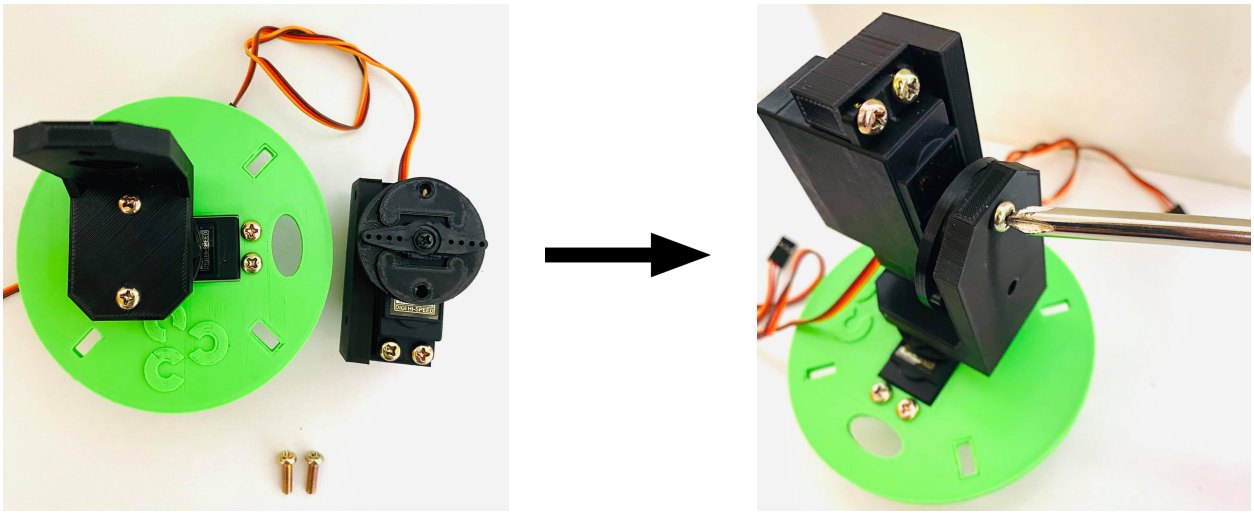
Step 3

Join the wing from the servo-motor package with the plastic locker labeled 'P', then use a screwdriver to attach the servo-motor to the plastic locker.



Step 4

Gently install the servo-motor bracket onto the L bracket with the two screws using a screwdriver as shown below.

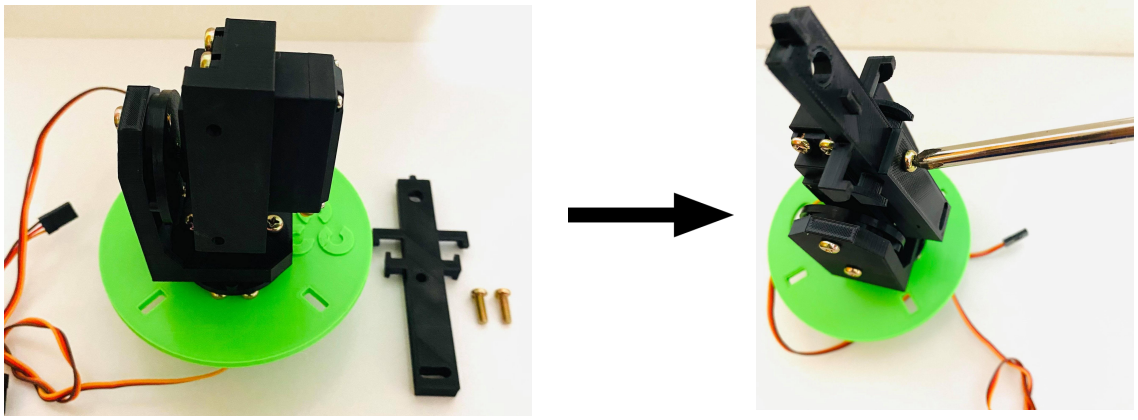


Mount the OpenCV camera on the device

The parts needed for assembling the mount for the OpenCV camera are shown below.

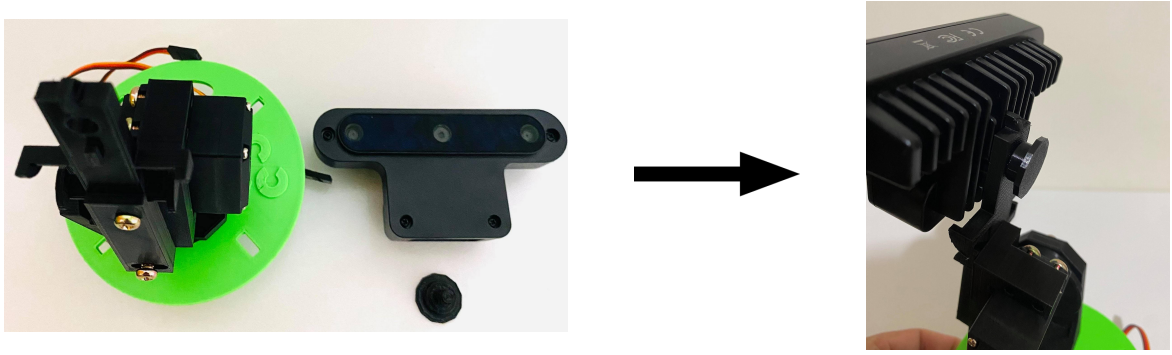
Step 1

The camera bracket should be attached to the second servo-motor bracket edge as shown below.



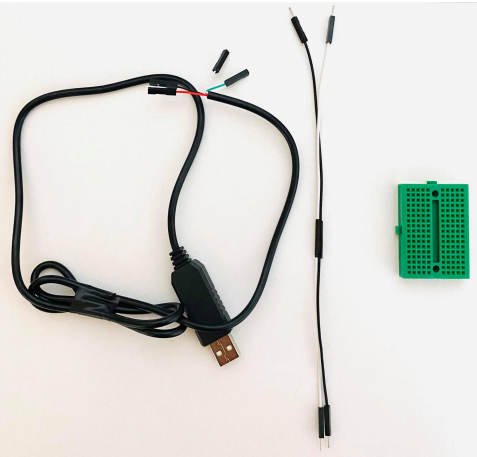
Step 2

Gently secure the camera with the black plastic screw as shown below.

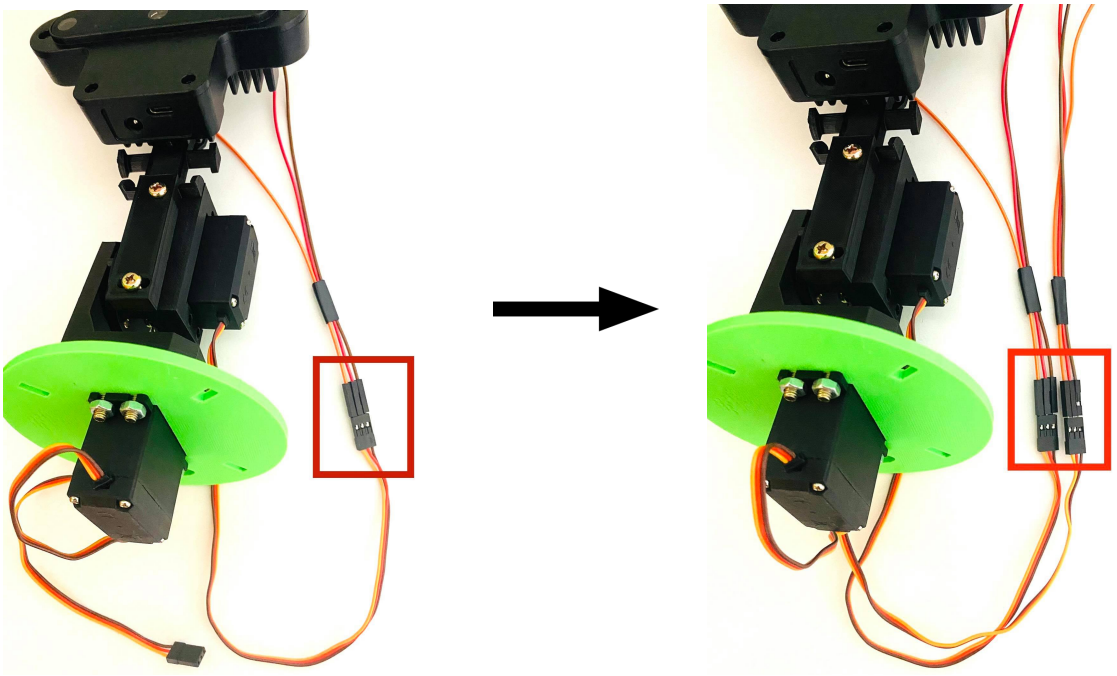


Connecting the wires to the Arduino board

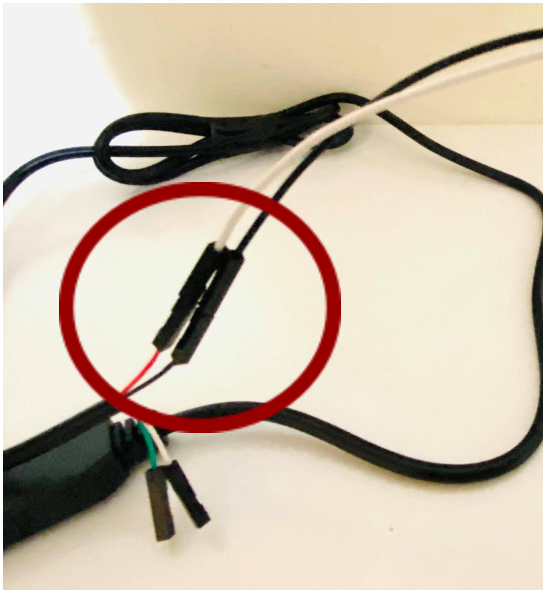
The following items below will be needed in order to complete this section.
Note: To avoid confusion, it is important to pay attention to how we will be connecting the wires.



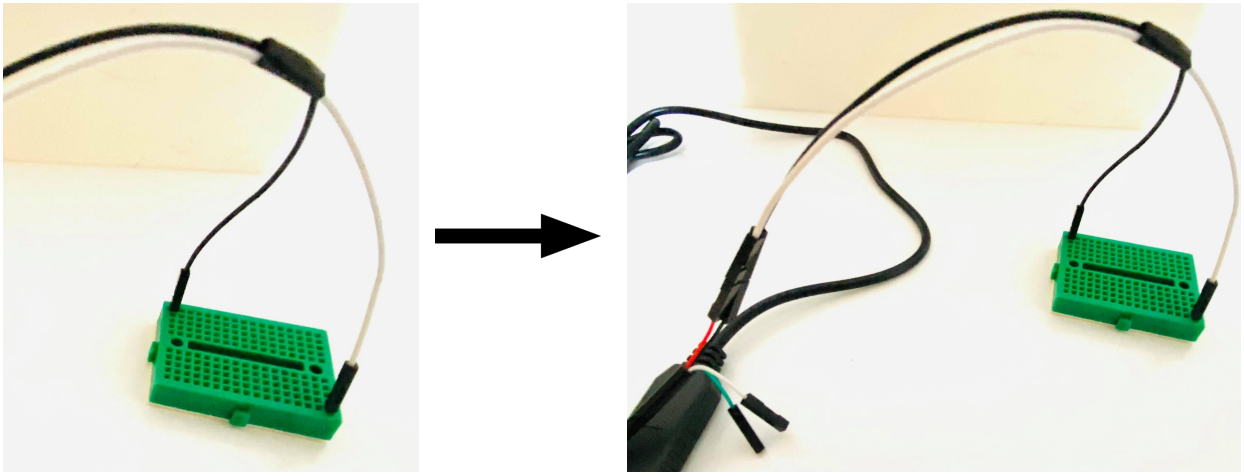
Step 1
When finished assembling the mount device, take the 6 male-to-male red, orange and brown connectors and insert them into the two servo-motors as shown below. To avoid confusion with the connection, it is always helpful to use the same colors.
Note: It is highly recommended to tie the wires together with electrical tape as shown in the picture.



Step 2: Connecting all the necessary wires to the breadboard.
Take the male-to-male white and black connector, then insert the black male-to-male connector into the USB TTL black cable connector. This will be for the ground.
Next, take the white male-to-make connector and insert it into the USB TTL red cable connector which will be for the power source.

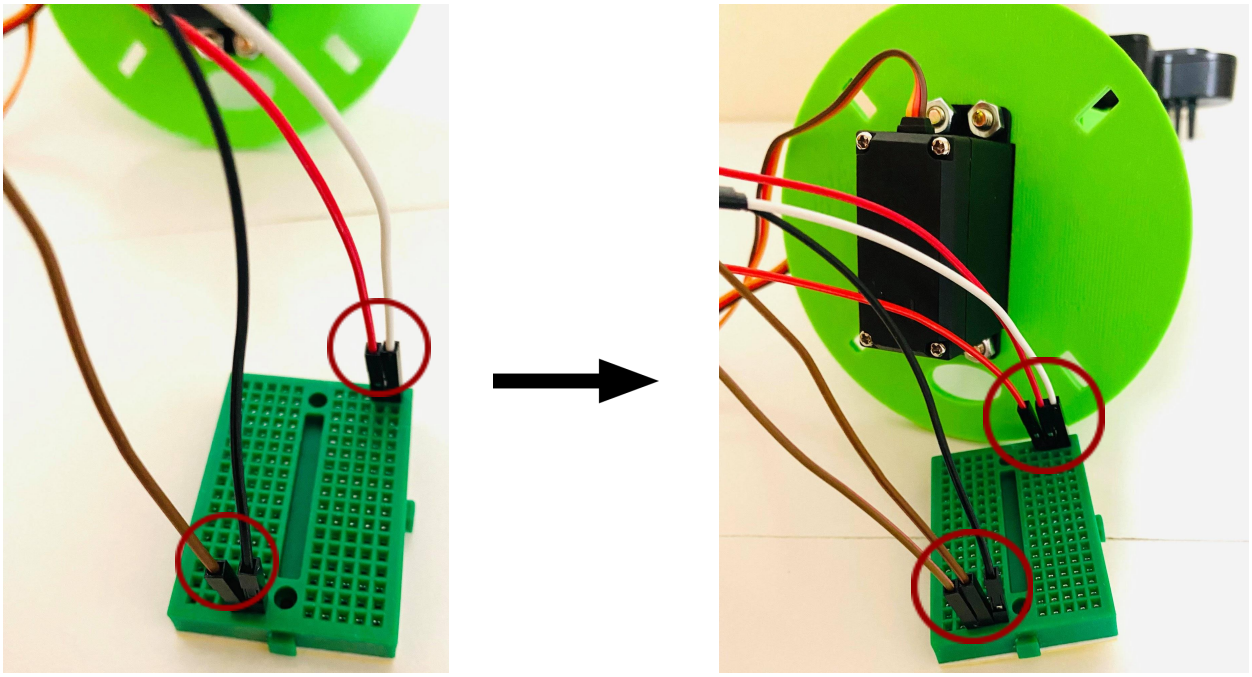


Step 3
Lastly, take the other end of the USB TTL cables and insert them into the breadboard. Please make sure to insert them on the opposite sides of the breadboard as shown in the pictures below.



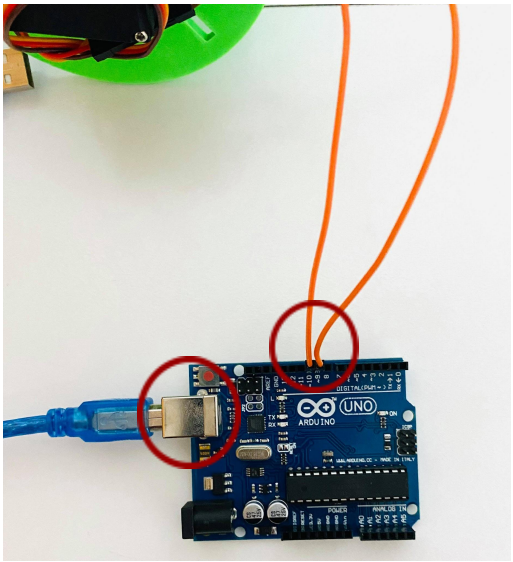
Step 4

Connect the male-to-male wire to the breadboard. The red male-to-male wire should go next to the white male-to-male wire, and the brown male-to-male wire should go next to the black male-to-male wire on the breadboard.



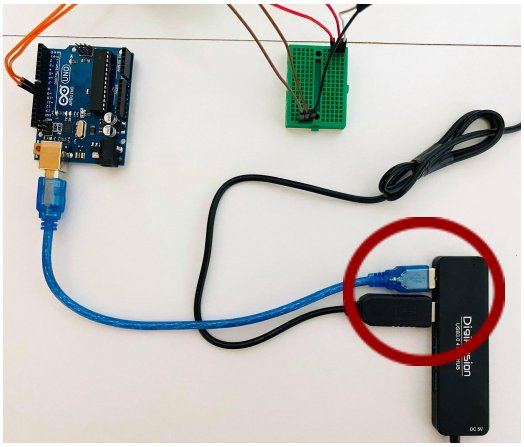
Step 5

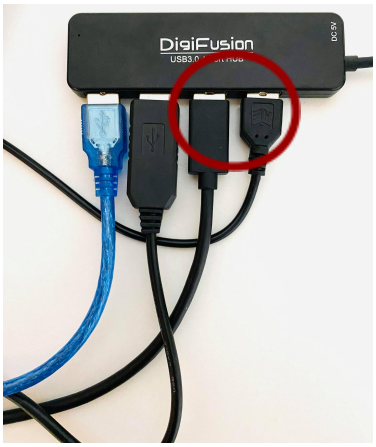
Connect the male-to-male orange wire to the Arduino board. Make sure that you have chosen the correct pins (for example, we selected 9,10) to establish communications between the Arduino board and Python. Finally, connect the USB cable type A/B to the board's USB port.



Step 6

Connect the Arduino board and breadboard cables to the USB 3.0 4 port hub, make sure to also connect the camera USB cable and the DC-in jack USB cable as shown below.





Step 7

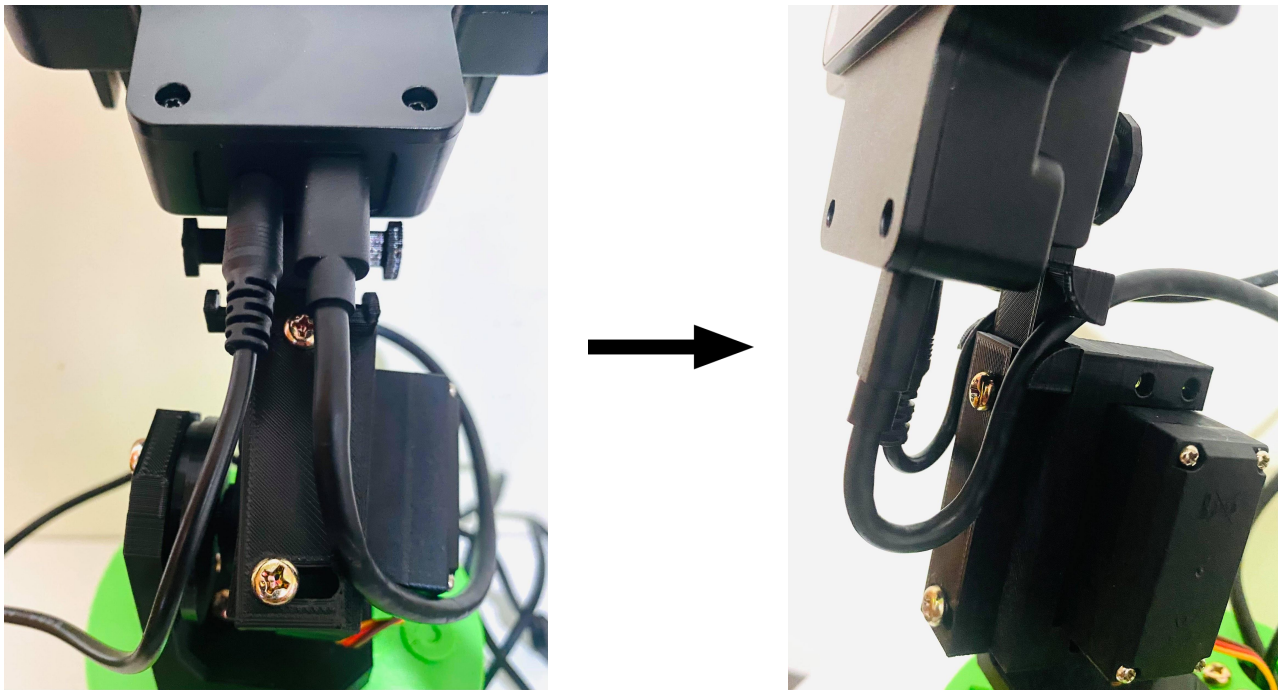
Gently insert the USB 3.0 cable into the whole behind the container and then carefully insert the arduino board, breadboard, cables and wires into it.

Step 8: Attaching the cables to the camera

Once you've placed all the items in the container. Use the plastic cover whole to insert the servo-motor wire, and to pull out the camera USB cable, and DC-in jack cable for easier access.

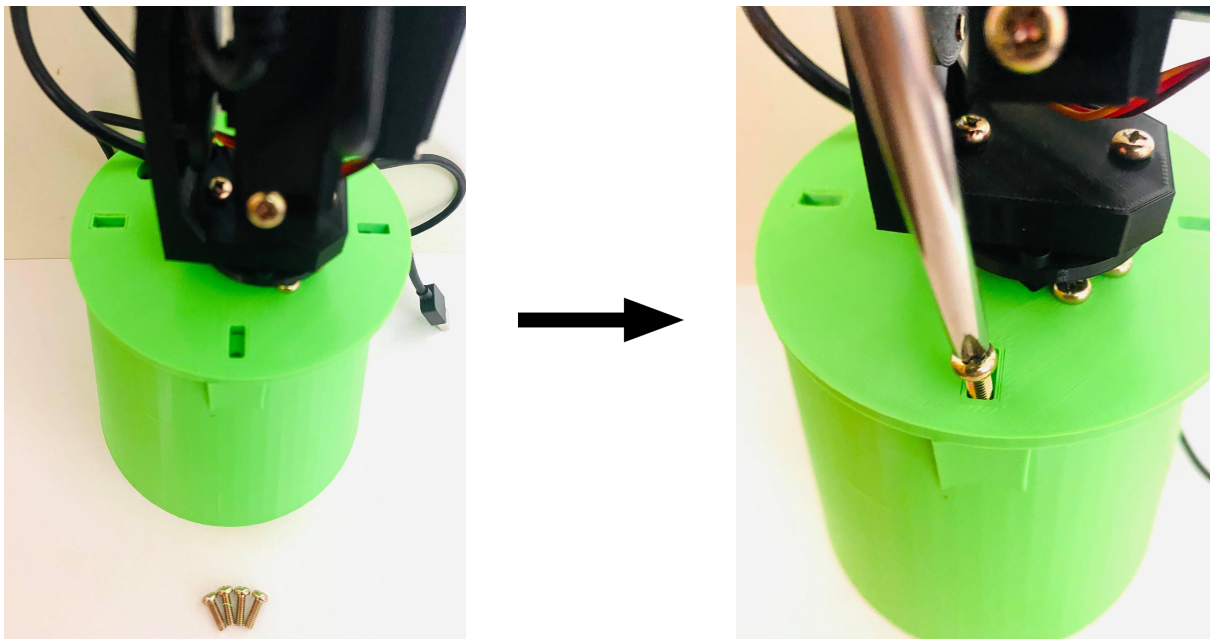
Step 9

Connect the USB camera and DC-in jack cables into the camera and secure it on the camera mount bracket as shown below.



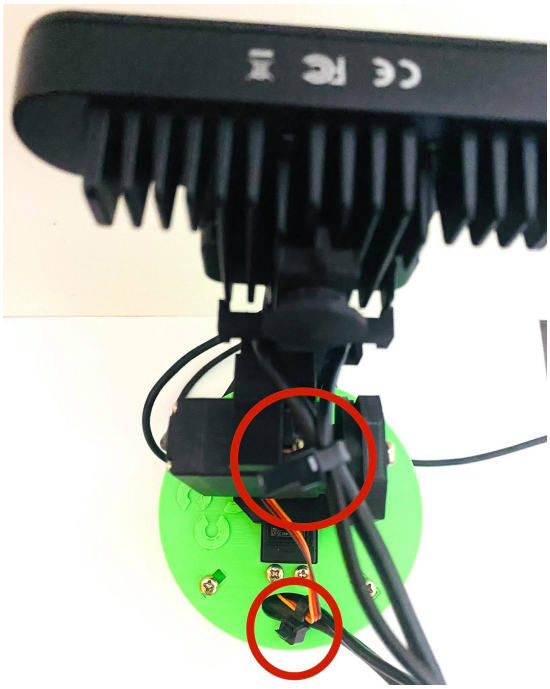
Step 10

Take the four screws and gently secure the plastic cover on the container as shown below.



Step 11

Finally, to secure all the cables connected to the camera, it is recommended to use two zip ties, one at the top and other at the base of the cables as shown below.



Upload the code to the Arduino board

Step 1
Connect the USB3.0 cable into the USB port on the computer.

Step 2
Follow the instructions in github to see how to set up the Arduino, test the servos and home in the servos.