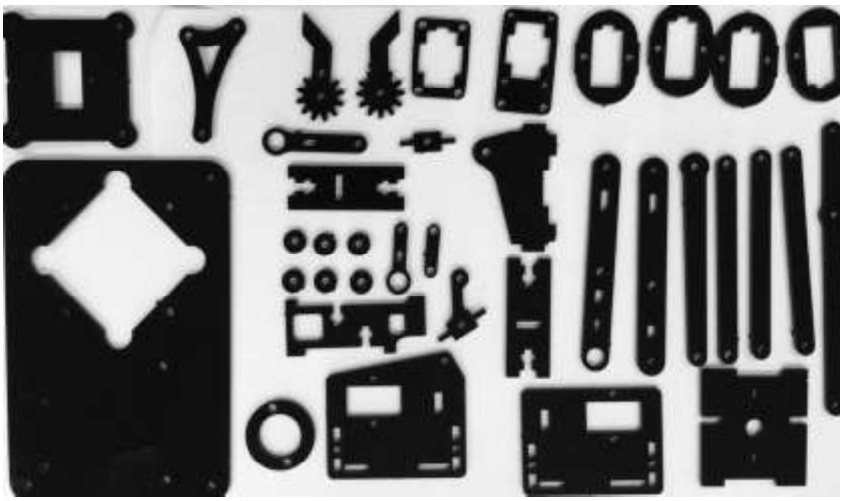
Chapter 6. System Debugging

6.1. Rack mounting

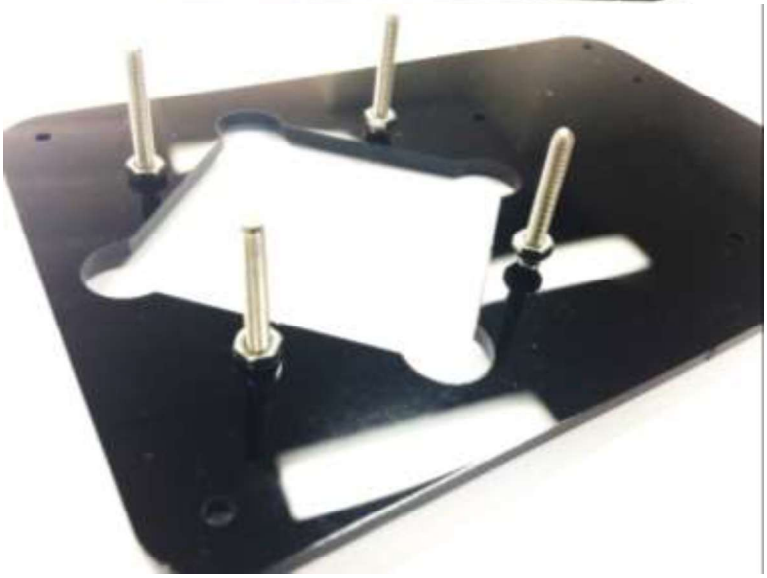
In this section we are guiding you through the Robot Arm Base and rack installation.



Peer off the protection paper of the rack base

Prepare the items:

- Base
- 4 x M3 nuts
- 4 x M3 * 30 mm screws

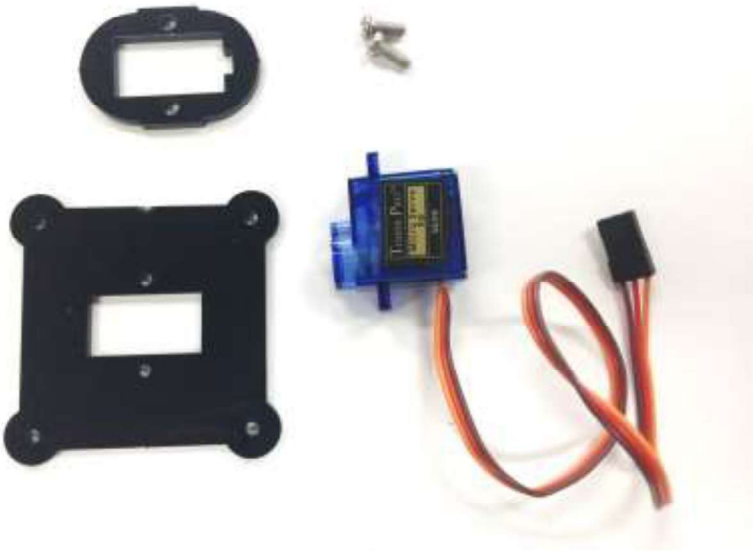


Assemble the parts as shown on the left

Prepare the items:

- 4 x M3 nuts
- 4 x M3 *10mm screws

Fasten the screws and nuts as shown on the left, which are used to secure our Iduino UNO Board



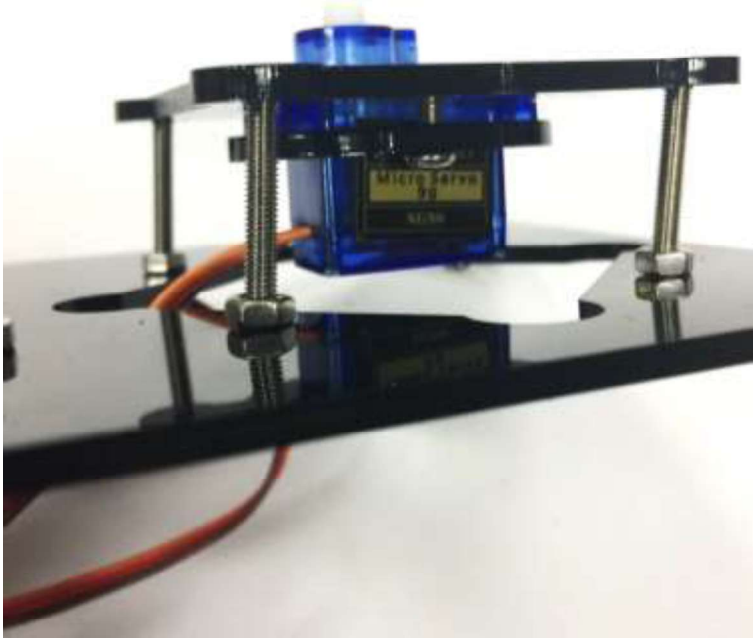
Then prepare the items:

- 2x M3 *8mm screws
- Black Servo holder
- Black Servo rack

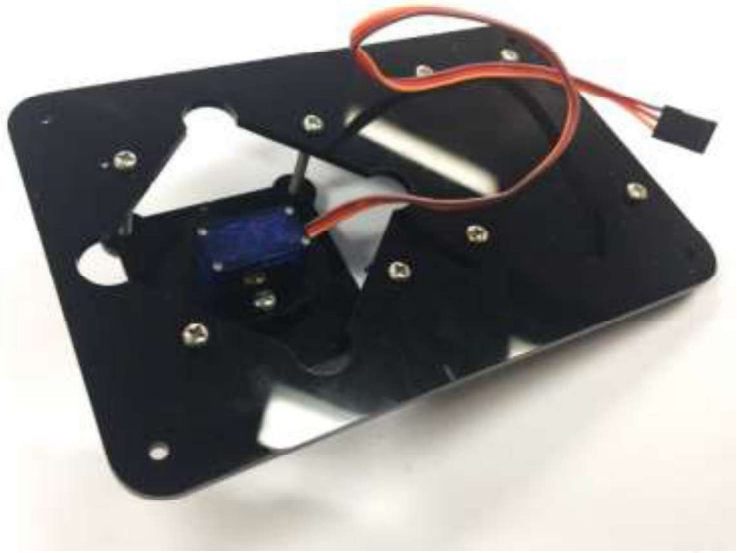
Pull the cable thread through the servo bracket hole as required to connect to Iduino UNO Board in the following steps

Then insert the Servo bracket holder on the top of servo holder. Now you can see Servo is secured and sandwiched between holder and bracket.

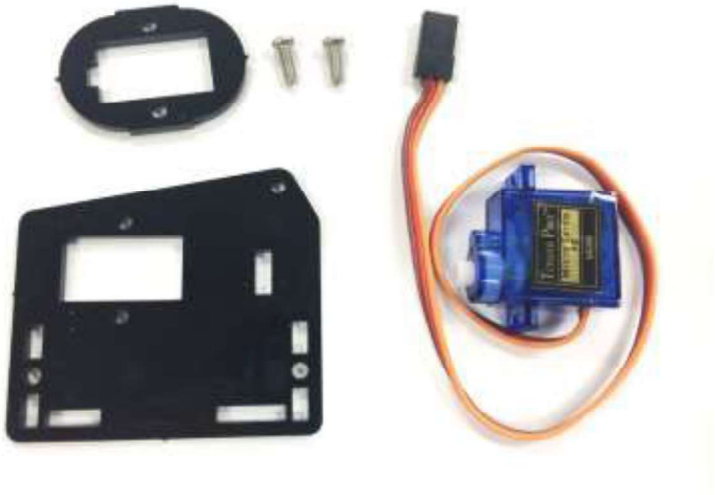
It should look like this



Then secure it as shown on the left

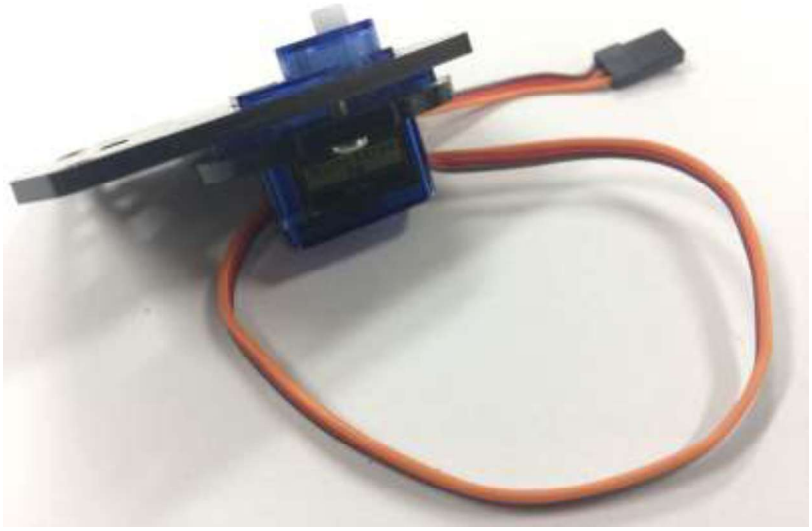


It should look like this



Then prepare items to build Forearm of the Robot

1. 2 x M3 *8mm screws
2. One Servo Bracket
3. One Servo SG90
4. One Black Main Arm Base

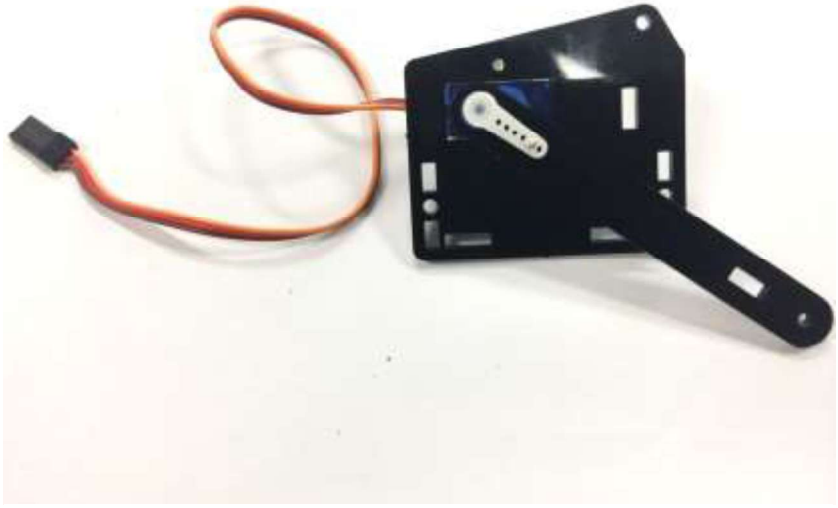


Secure the Servo with Bracket and Base in the same way as instructed in the last Servo

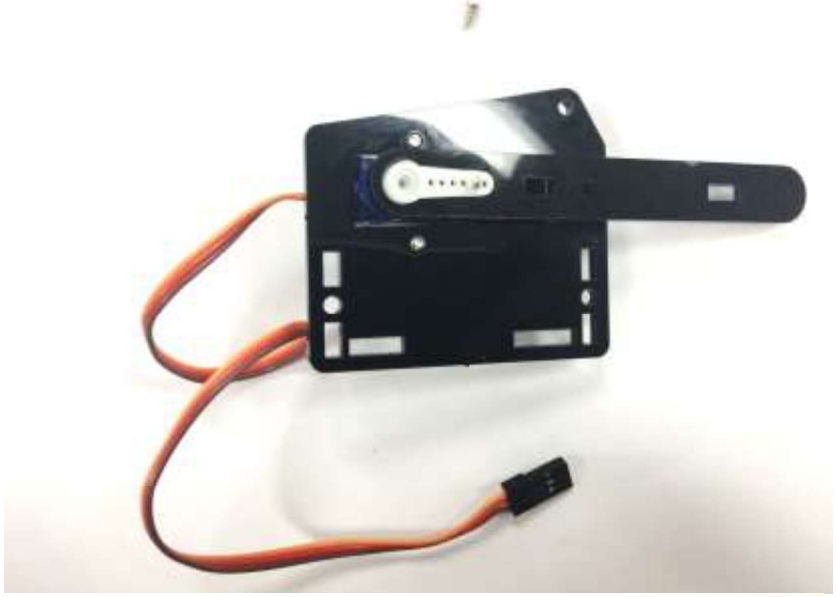
Prepare the items:

1. 1 x M2.5 tapping screw
2. One Servo Horn

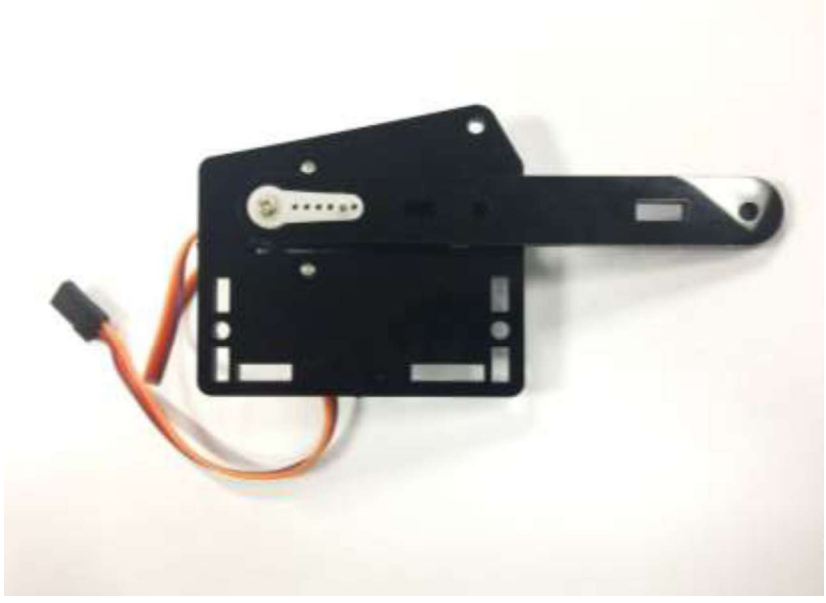
Secure the Horn on the black Main arm acrylic with M2.5 tapping screw



Insert Main Arm onto the Servo and rotate it clockwise until it stops rotating as it is programmed to rotate anticlockwise.



Pull out the Main Arm and put it back horizontally, this step is to ensure Servo will turn anticlockwise from this very point (0 degree) and not break the arm when power turns on to rotate

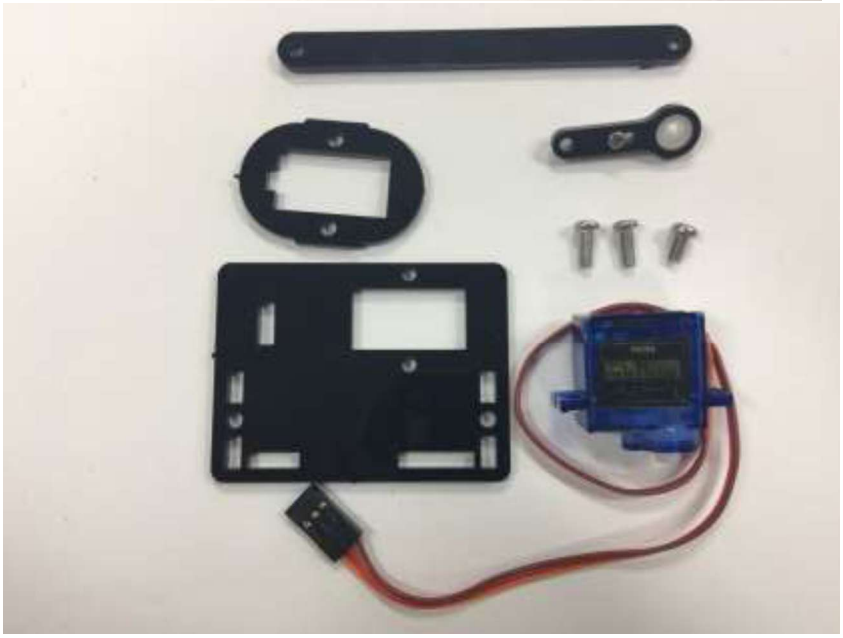


Gather a self-tapping screw from the rack package and secure it shown on the left

Gather the items:

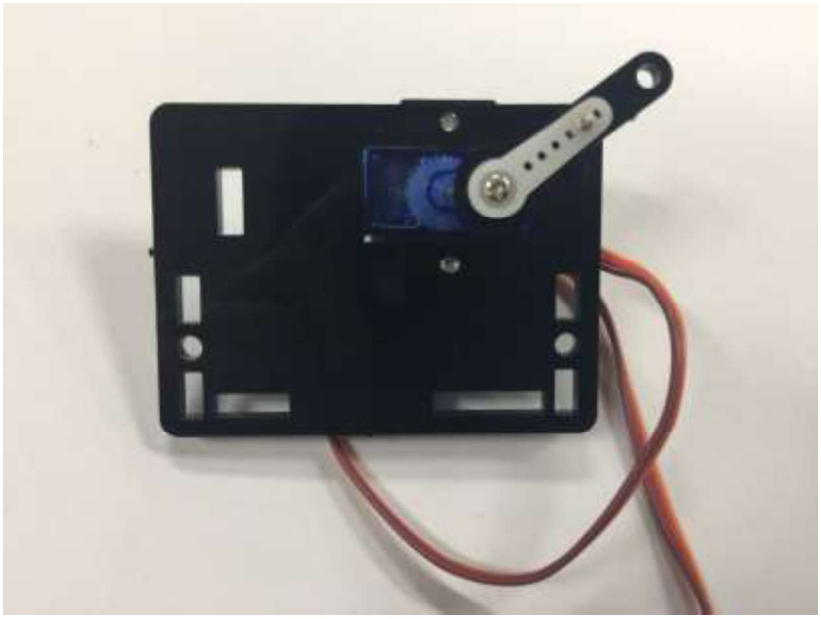
1. M2.5 Tapping screw
2. Servo horn
3. Black Acrylic Arm Joint

Then secure the horn to the Acrylic arm



Then let's build the forearm,

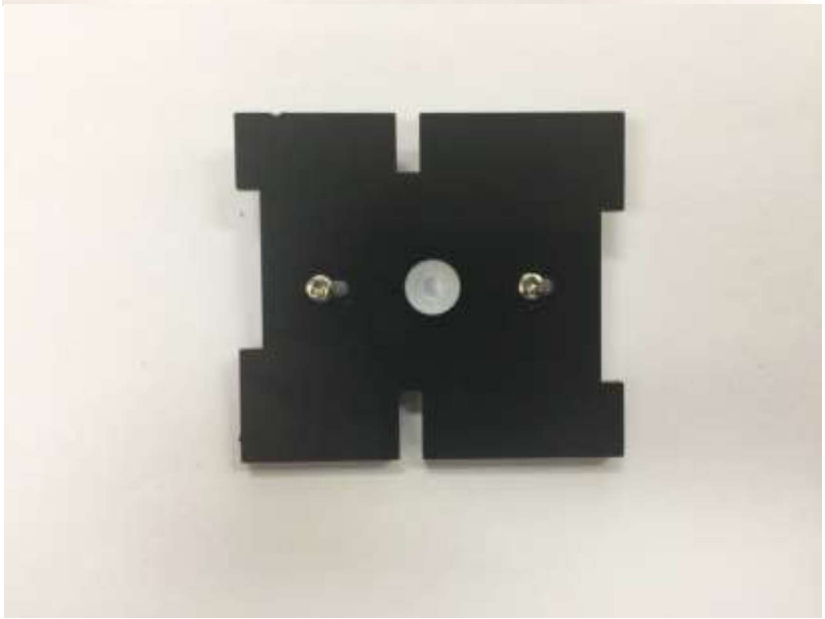
1. 2 x M3 * 8
2. Self-Tapper Screw (From the servo package)



Assemble the servo on the black rack base in the same way as shown in the previous instruction.

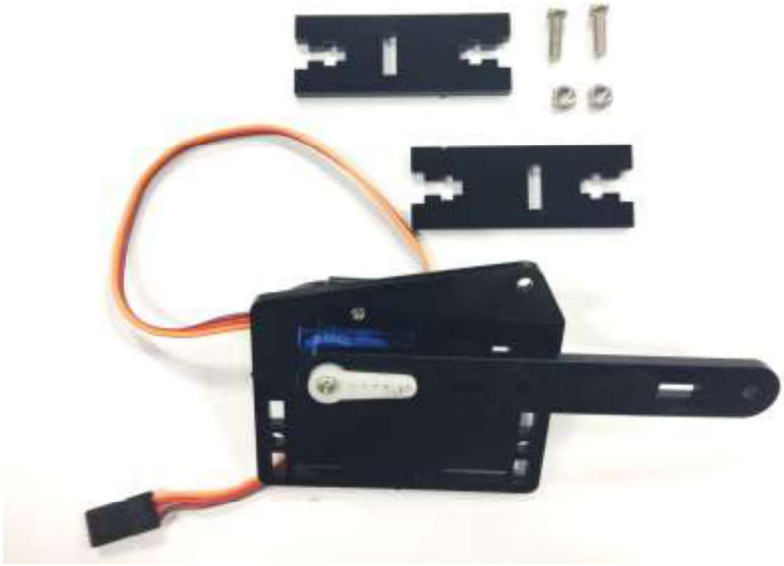
Prepare the items:

1. 2 x tapping screws from the servo package
2. one M3 * 8
3. One Servo Horn



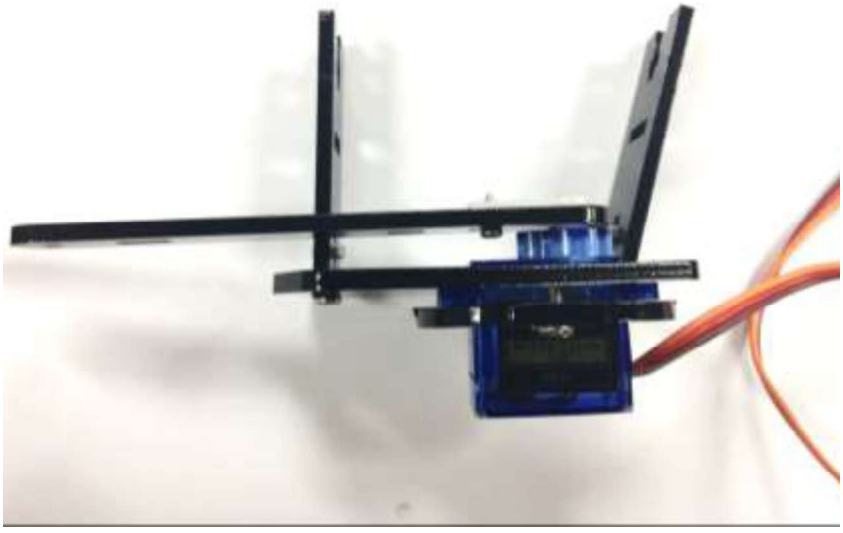
Secure the Servo Horn on the Rack Base

Connect two active joints by screw, remember do not over tighten the screws as they are required to rotate freely

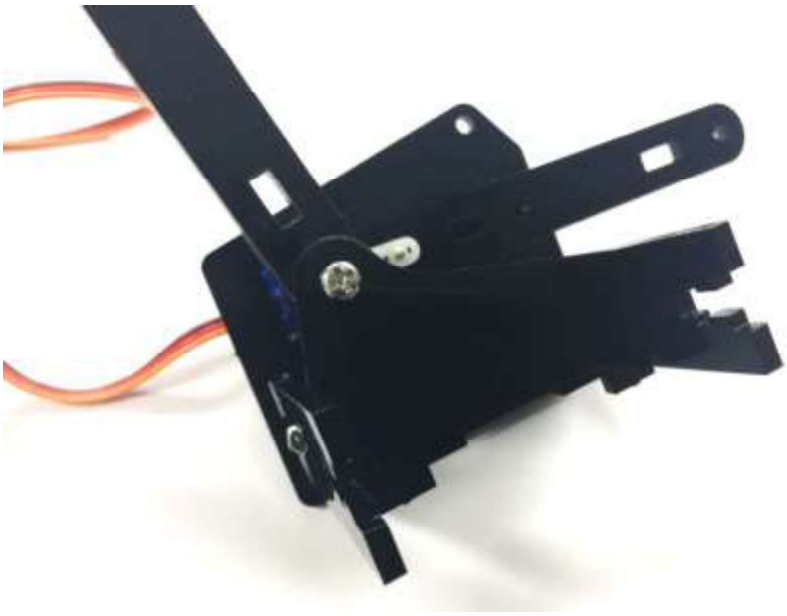


Prepare the items:

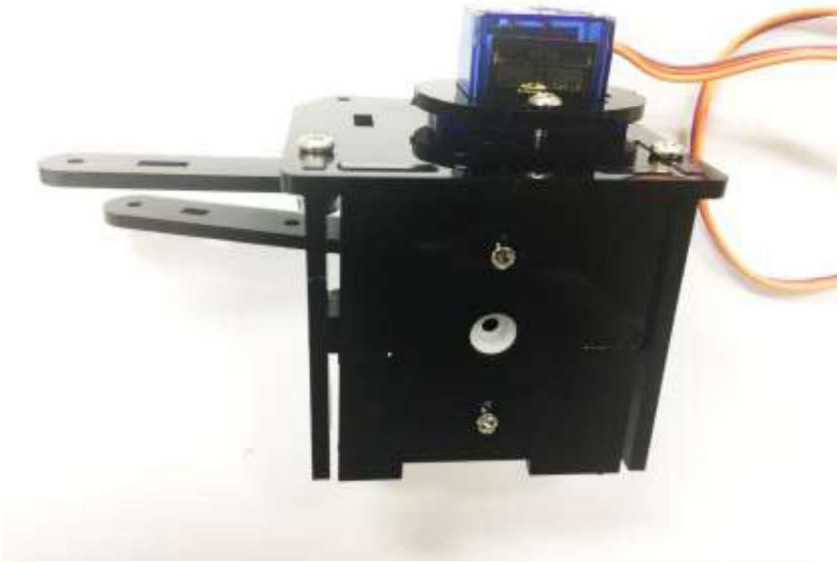
1. 2 x M3*10mm
2. M3 nuts
3. Two black Clapboard Acrylic



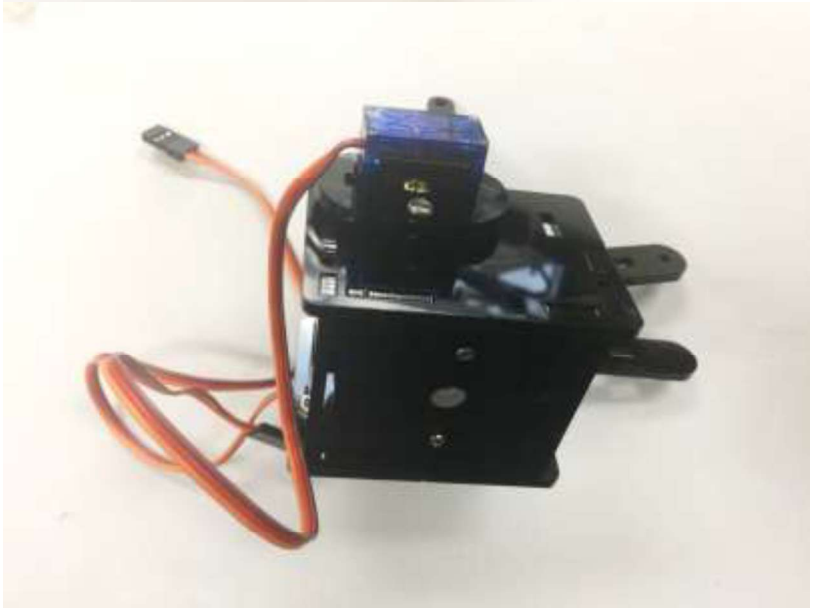
Place the two Clapboard Acrylic in the corresponding wing slot



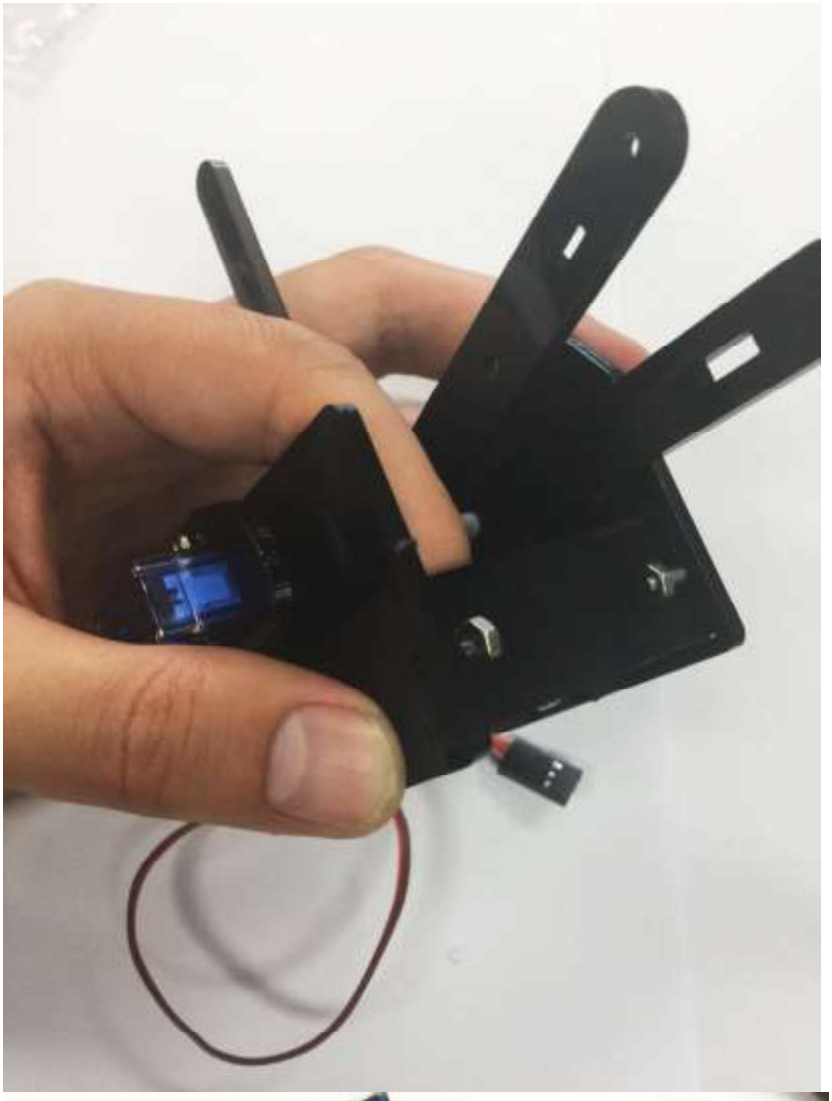
Firstly, insert the Clapboard in the corresponding slots and in the following steps it will be secured with one screw and nut on each side



Then insert the rack base in the corresponding slot between two clapboards

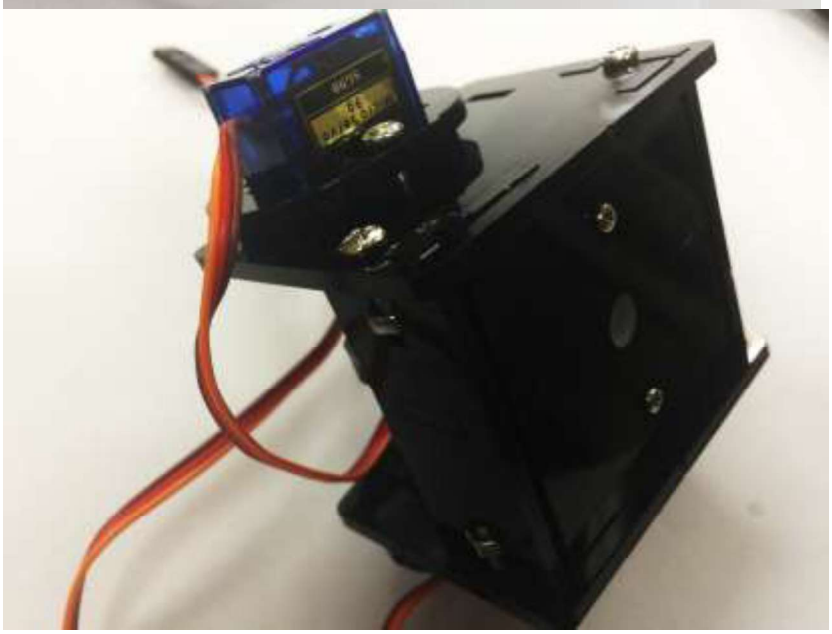


It should look like this

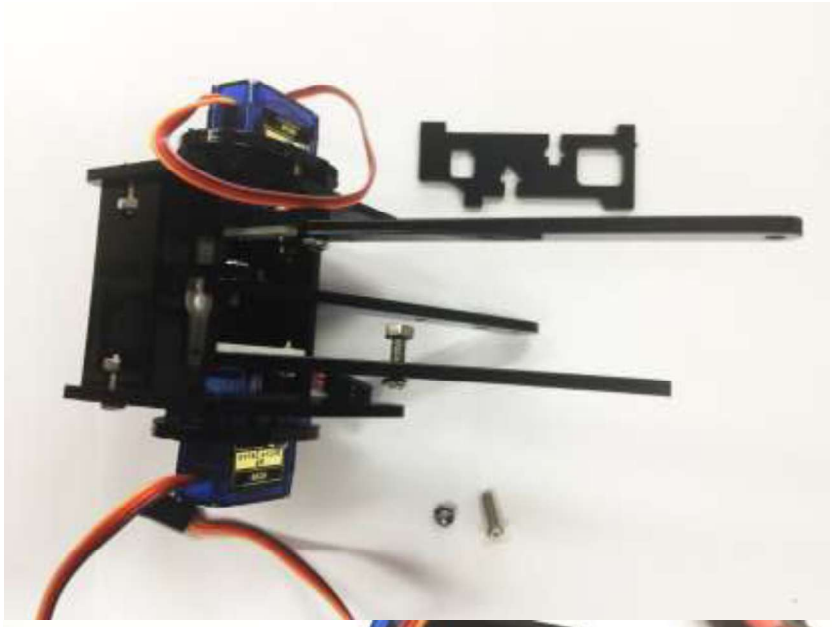


Secure the Clapboard on the Main Arm base with one pair of screw and nut.

Tip: Hold the nut in the slot and then screw the M3 in.



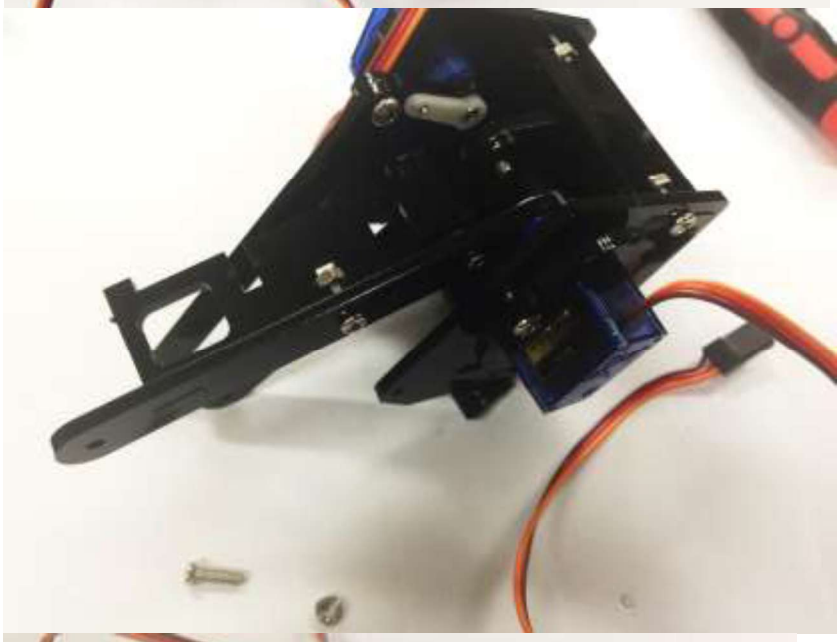
Secure the Clapboard on both side as shown on the left



Secure the backbone acrylic between forearm and main arm by:

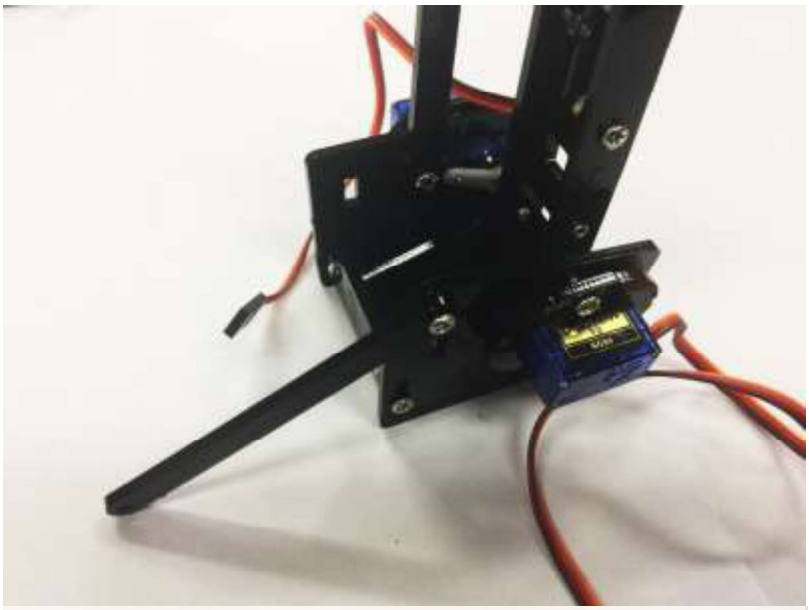
1. 2 x M3 * 10mm
2. two nuts

Tip: Hold the nut in the slot and then screw the M3 in.

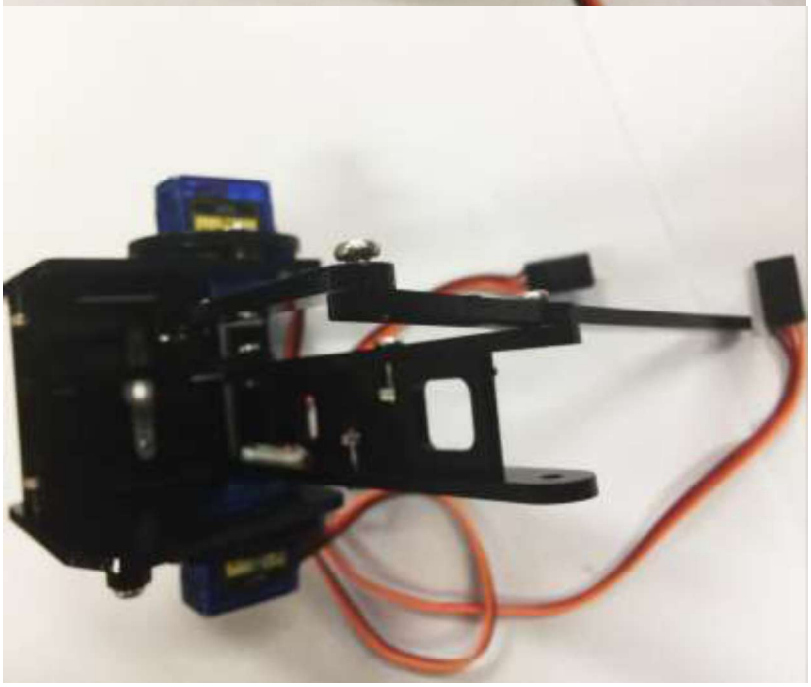


Fix the other side as well

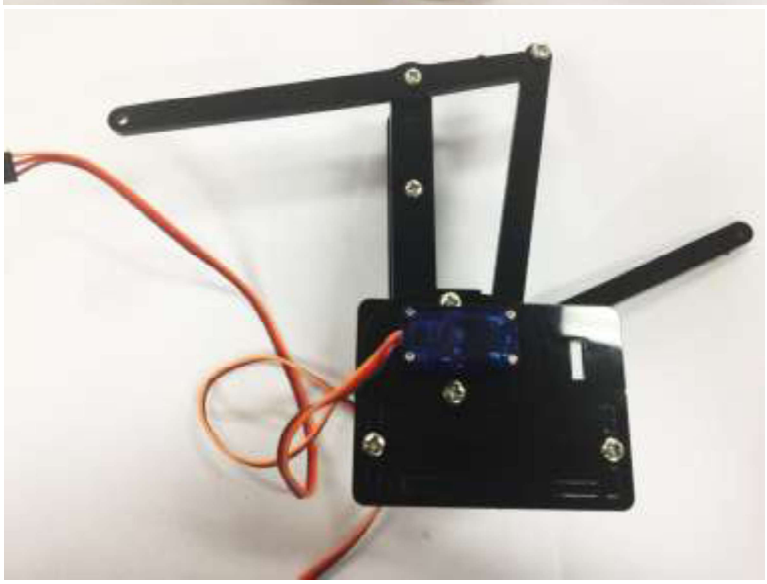
Then prepare M3*6mm screw and one long arm acrylic



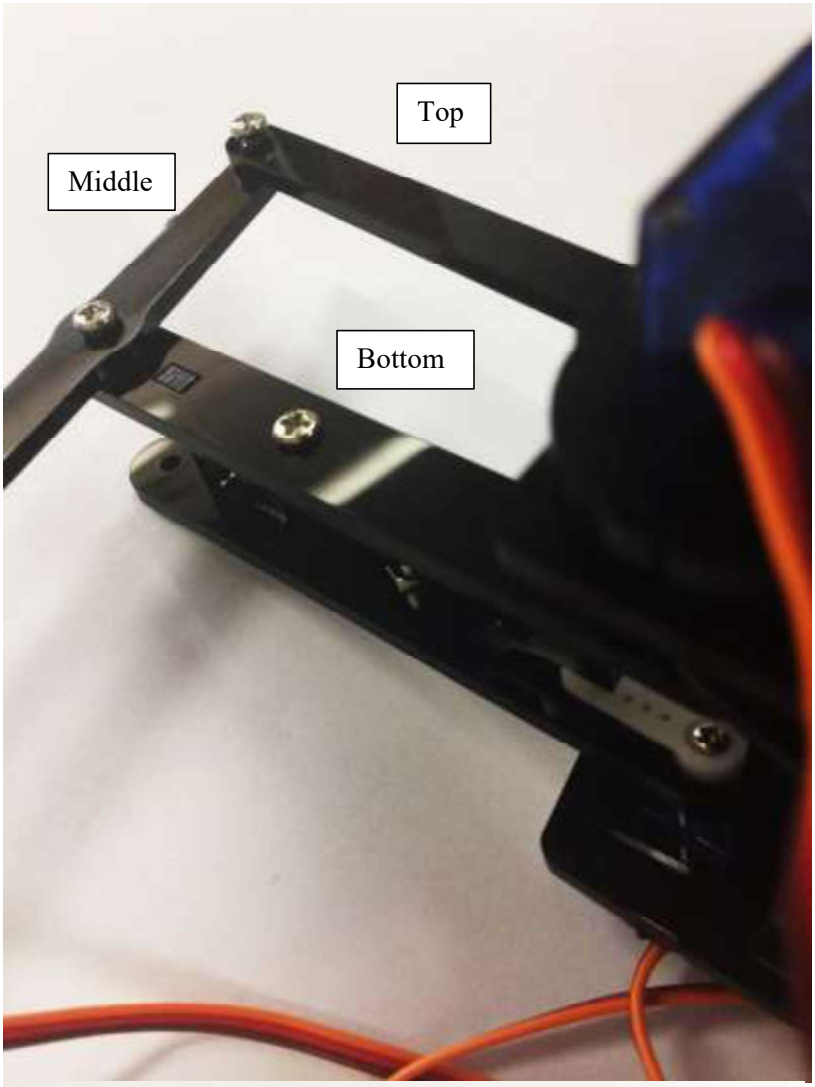
Secure it on the bottom right side



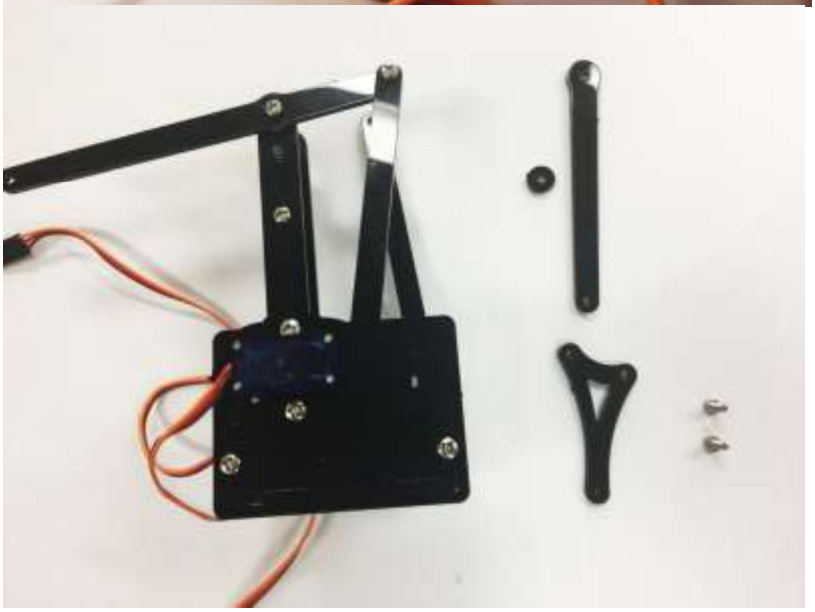
It should look like this



Then use another black long arm with three active joints to connect two forearm joints



Please secure the screws in the right sequence. Backbone acrylic in the bottom forearm in the middle and the other one lies on the top

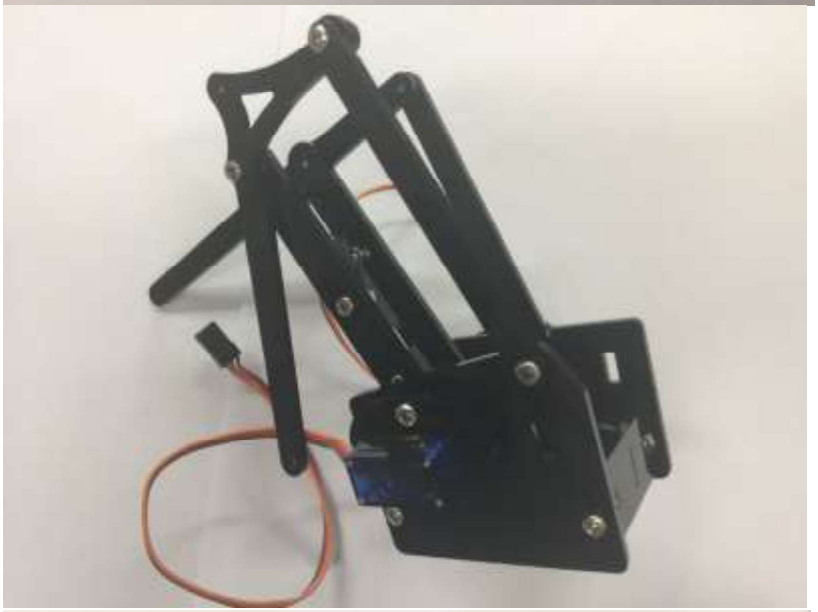


Prepare the items to build right side support arm:

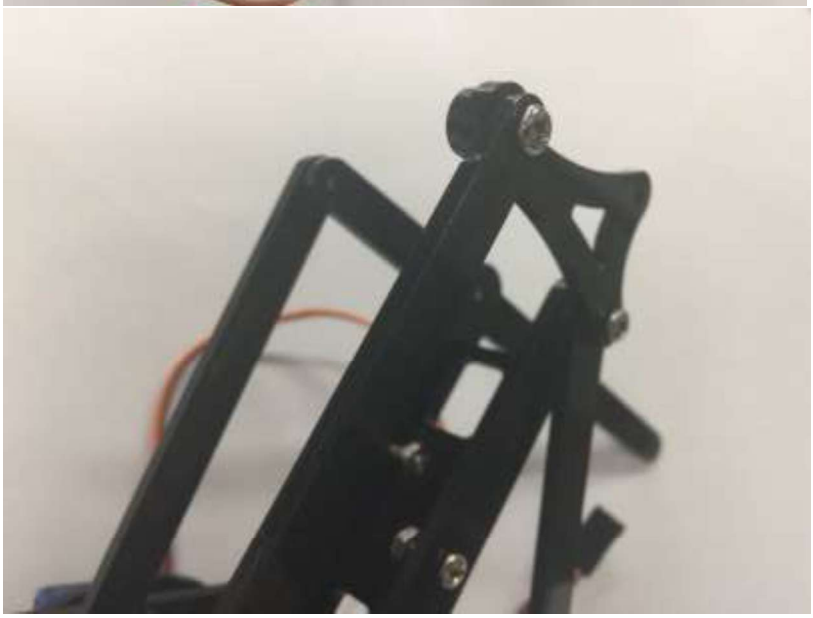
1. Two M3 * 8
2. One black circular spacer
3. One black Support arm
4. One black triangle support connector

Fix the first screw as shown on the left. The circular spacer lies in the between.

Please do not over tighten the screws as there are active joints as they need to rotate freely without rubbing the adjacent acrylics



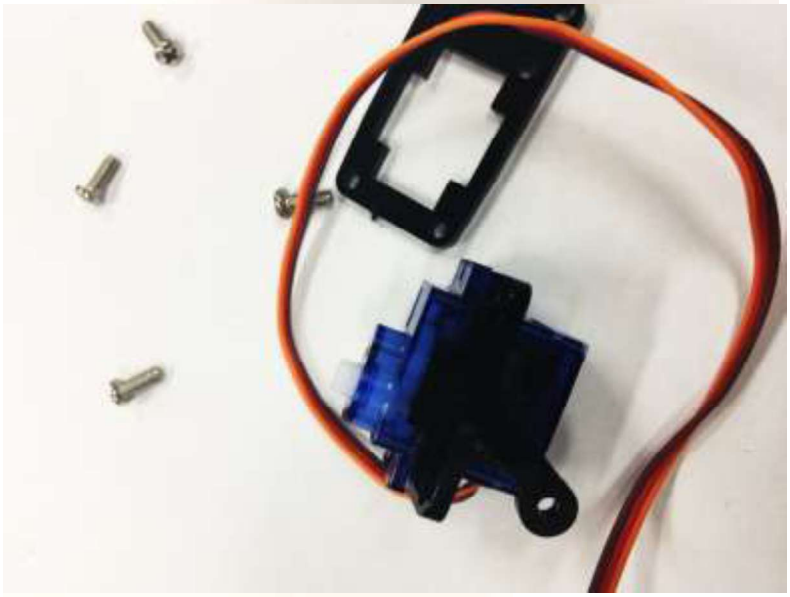
Fix the other end with black support arm.



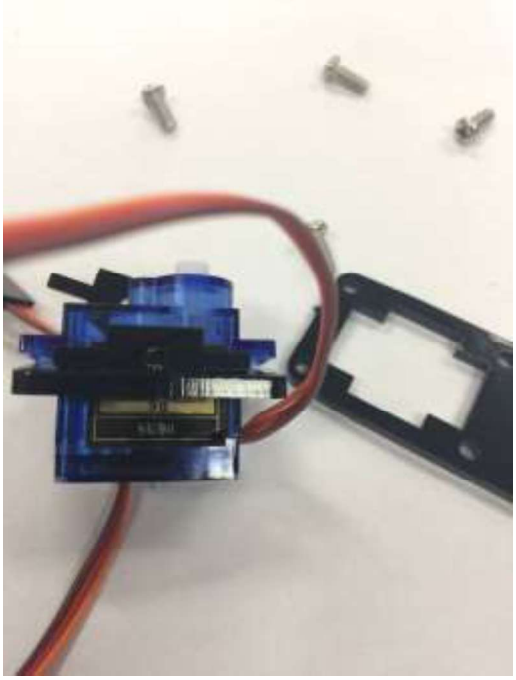
It should look like this. Now the forearm still has three free dangling ends which are eventually connected to secure the claw part.

Prepare the Claw servo parts:

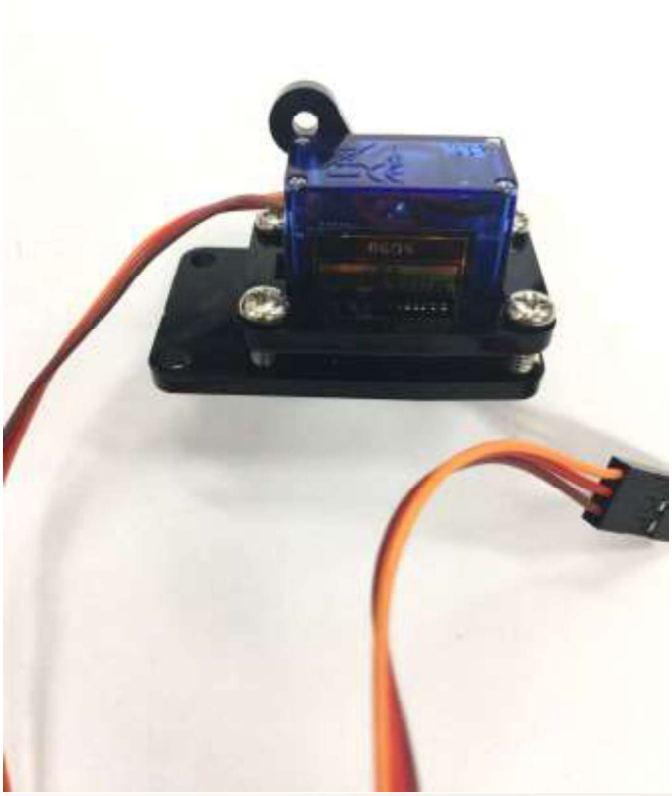
1. Two square servo brackets
2. 4 x M3* 8mm screws
3. One servo
4. Two connector accessories



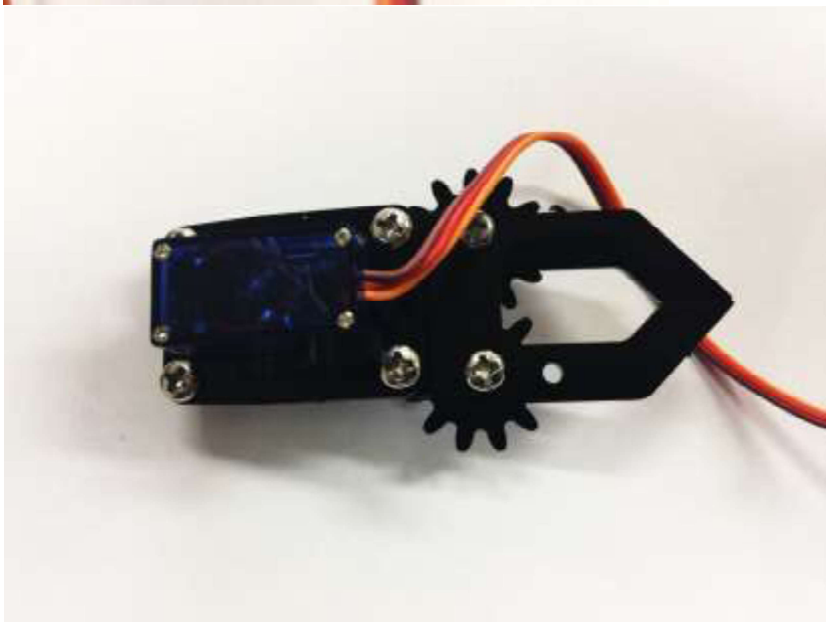
Place the square bracket in the bottom and pull the cables out as required to connect to Robot Extension Board



It should look like this



Place the rectangle bracket on the top of the Servo and secure the Servo with four M3*8mm screws



Fix the two claws on the rectangle servo bracket with two M3*6mm screws.

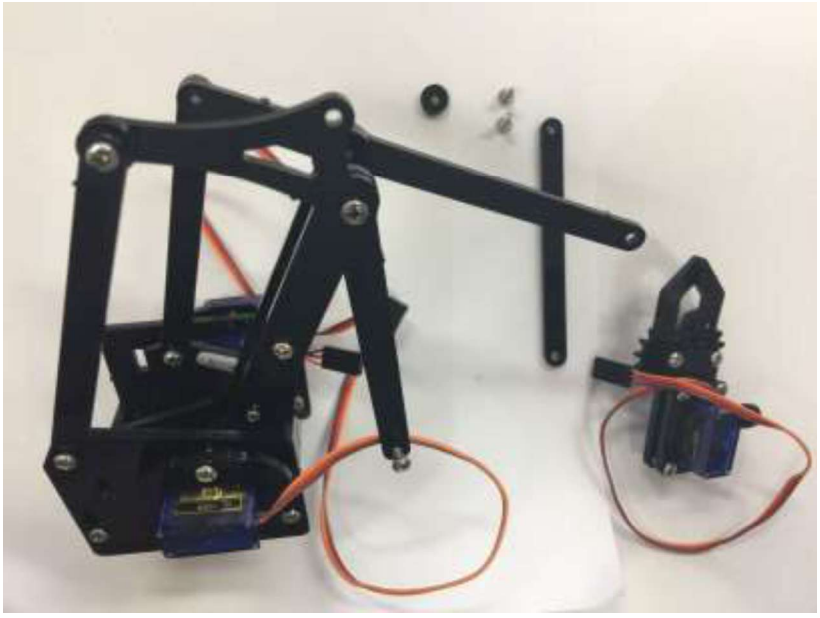
Remember to put one black circular spacer in between to reduce friction.

Then gather:

1. 4 x M3 *8 mm screws
2. One short connector
3. One circular spacer

Secure it on the left-hand side of the claw as shown on the left.

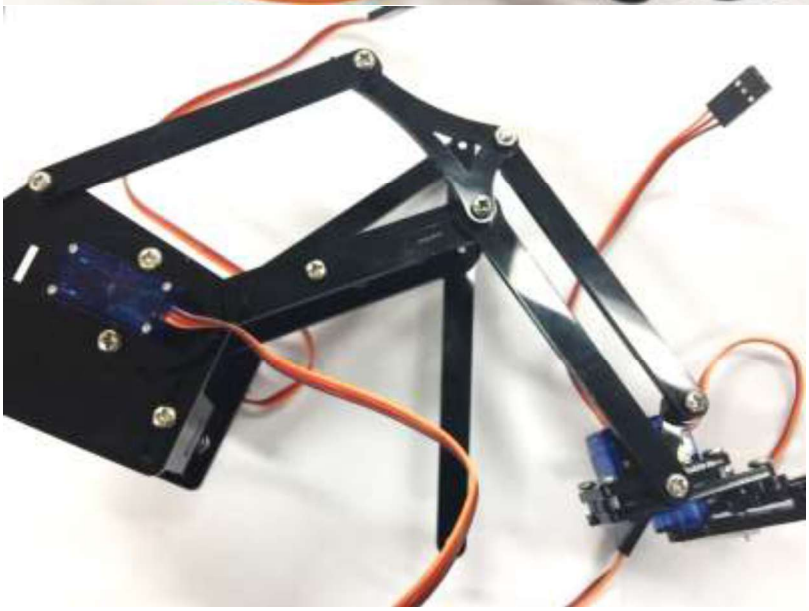
Remember to put the spacer in between



Prepare the following to connect Claw and Triangle support connector:

1. Two M3*8mm screws
2. One spacer
3. One support arm

Secure the Support arm onto the Triangle connector

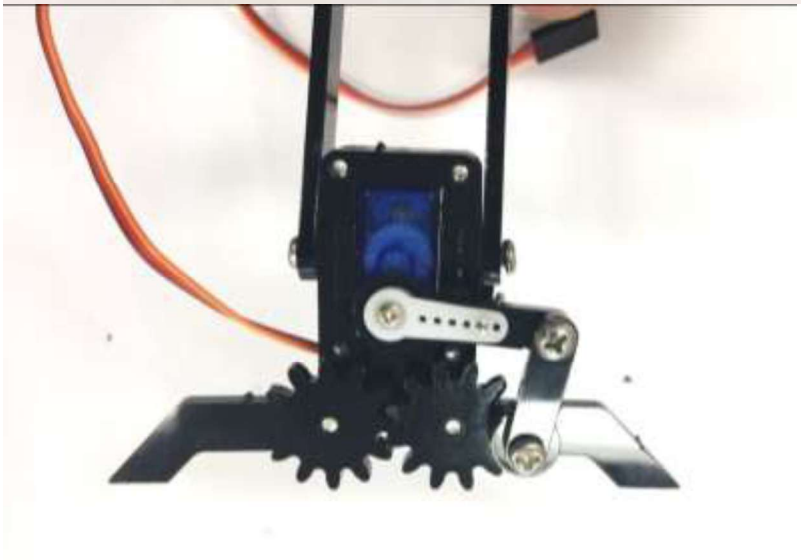


Then the entire Claw part can be secured with the three free dangling Forearm ends.

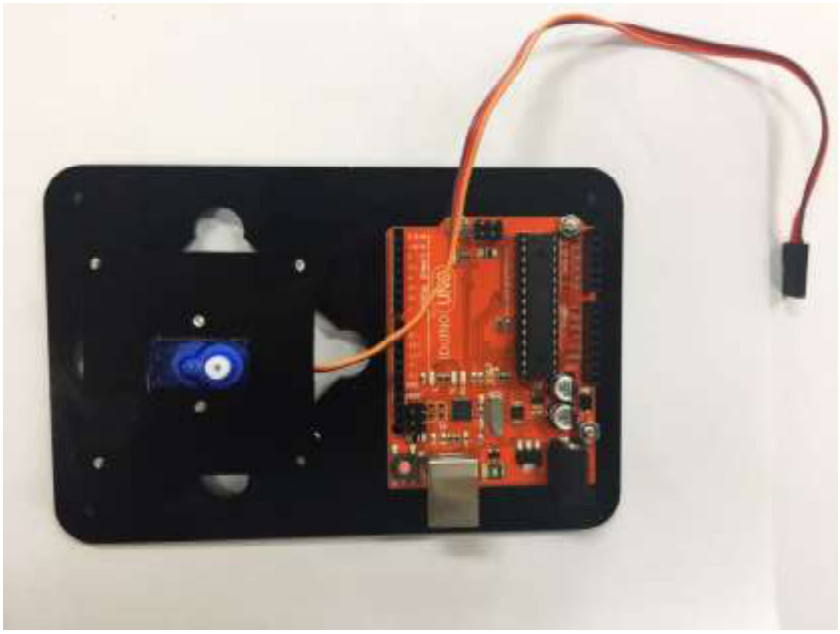
Please do not tighten the screws for active joints.

Prepare the tapping screw in the Servo package and servo horn.

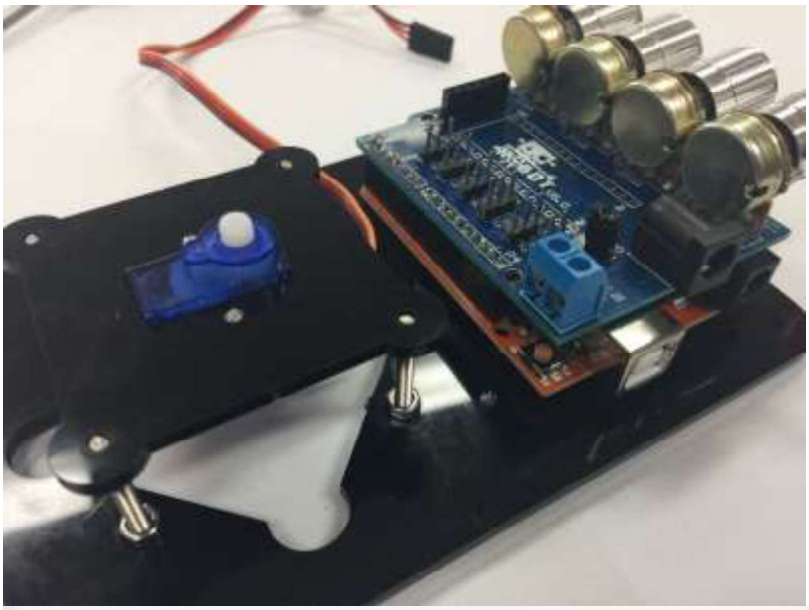
Secure the horn with tapping screw as shown on the left



Pull the claws widely open and then insert the short arm we created in the last step and screw it firmly.

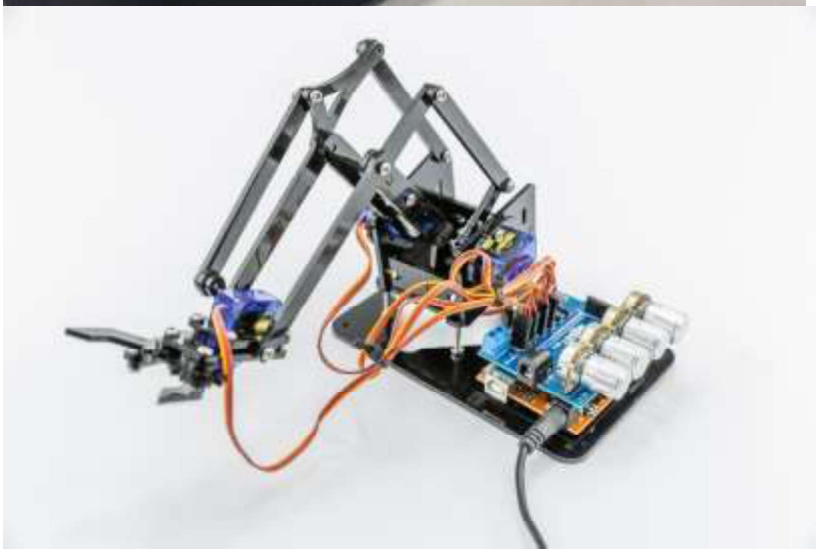


Secure the Iduino UNO Board on the Base



Place the Robot Arm Extension Board on the top of the Iduino UNO board.

Please make sure pins are connected properly.



Then place the Robot Arm System on the Base servo rack and fasten it onto the base servo with a tapping screw.

Now you have finished all the installation!