Swarm Robot Assembly Instruction

Components:

1. 3D printed robot base

2. Motor Holder

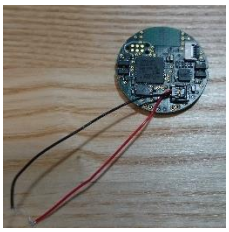
3. 2 M2 x 6 mm Screws

4. 2 Metal Balls

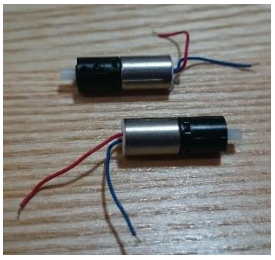
4. Battery

5. Switch

6. PCB



7. 2 Motors



8. Wheels (O-ring + 3D-printed part)

9. Crimps, connectors for Power Connector

** Future

10. Capacitive touch flexible circuit

11. Lasercut Outer , Inner Lid

Tools:

1. Wires (Use these ones not anything else!)

2. Wire Stripper

3.Wire holder (Very handy)

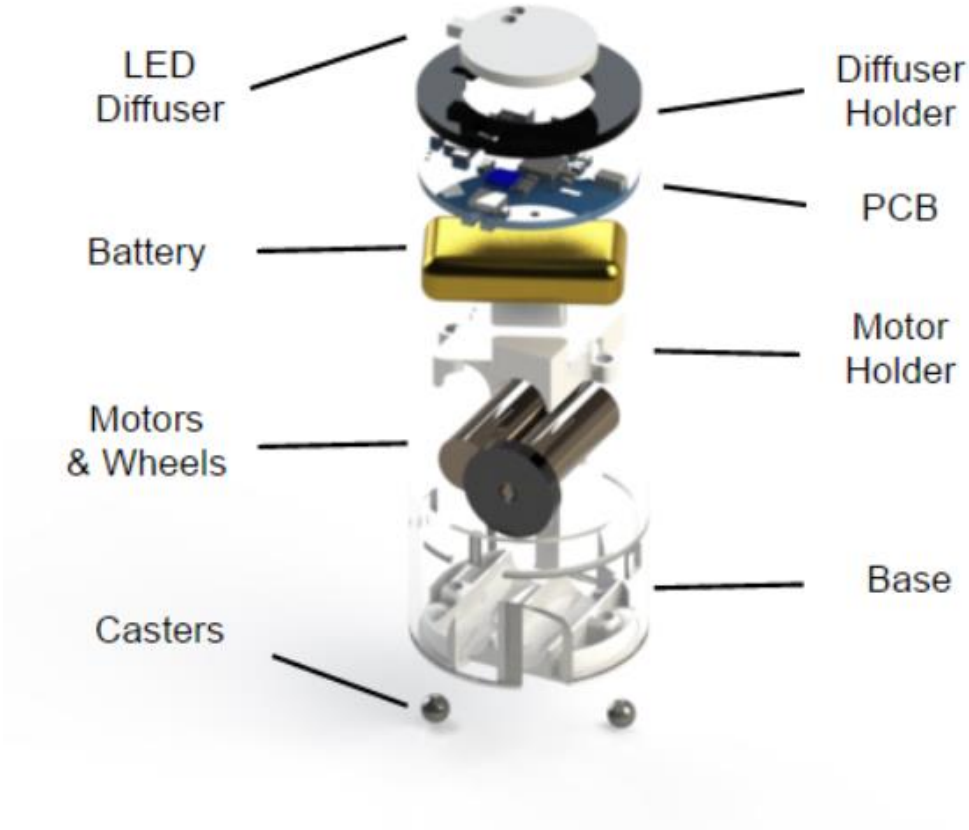
4. Wire Cutter

5. Screwdriver

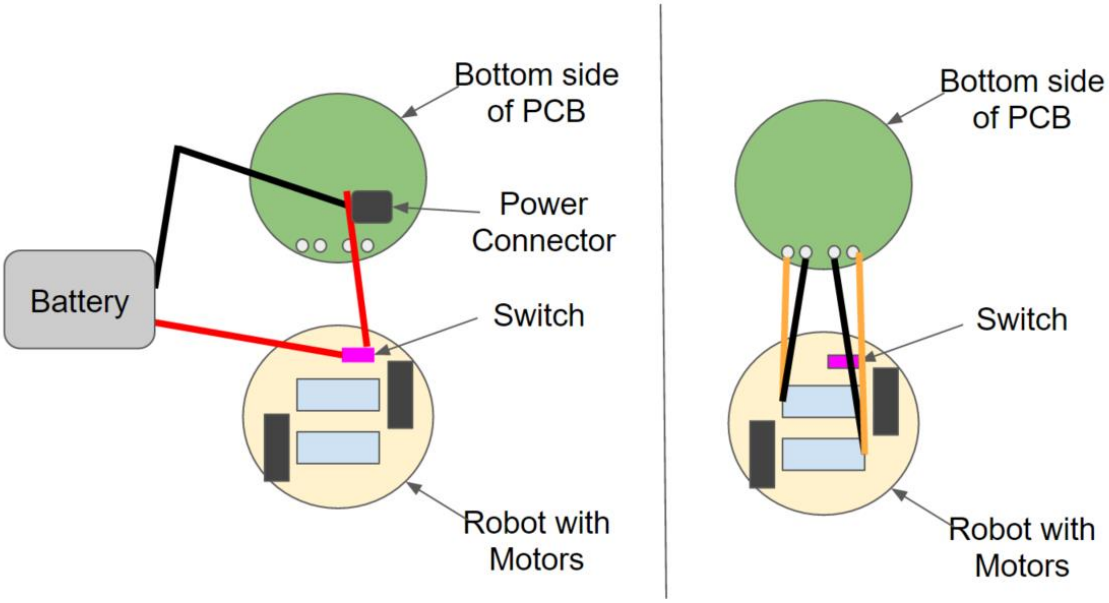
6. Crimp tool (For Power Connector)

7. Heat Tubes [Use smallest one]

Overall Structure:



Overall Wire Connection:

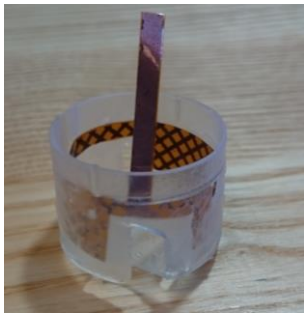


Assembly Steps:

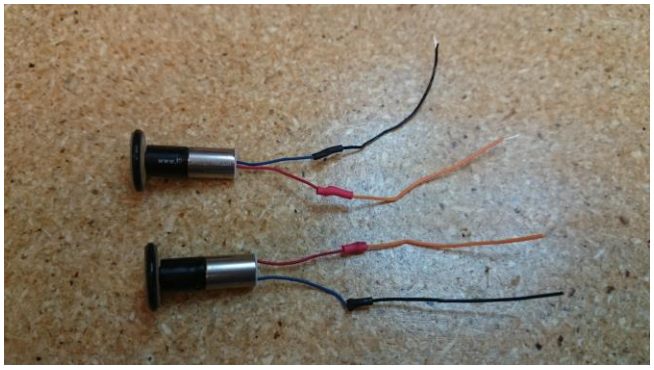
1. Print the robot motor holder from the Formlabs Printer with the **BLACK** resin. (stl. file is in google drive/Swarm Bots/Assembly folder)

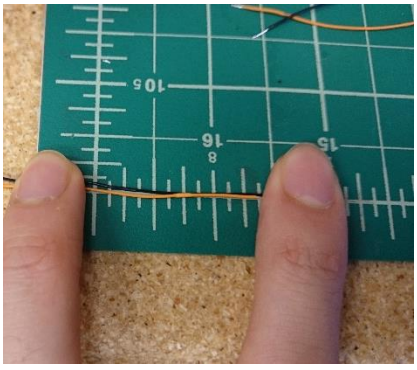
2. Rinse the parts and remove the support structures. Make sure that the surface where the motors will rest on is smooth for the motor holder.
3. Insert two metal balls in the slots on the bottom of the 3D printed robot base.

4. If necessary, Insert the touch circuit in the robot base as shown.

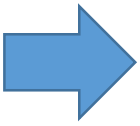
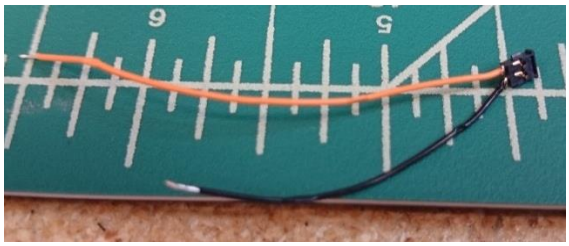


5. Extend the wires of the motor with wires of length 1 ½ inch. (Add heat shrink to cover the exposed soldered part of the wire)

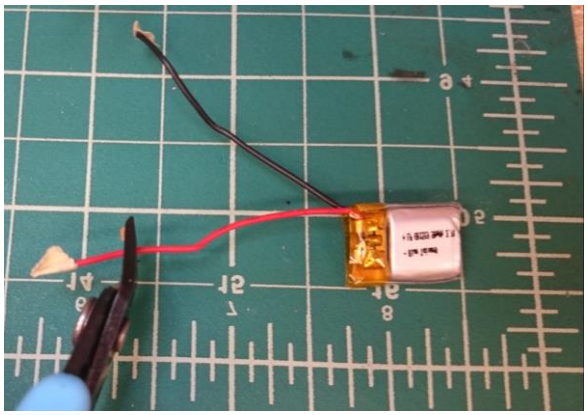
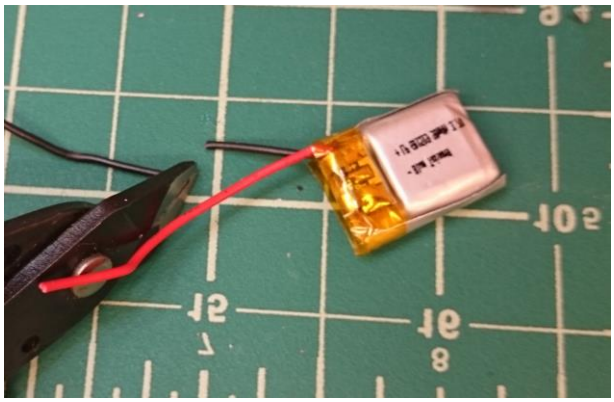




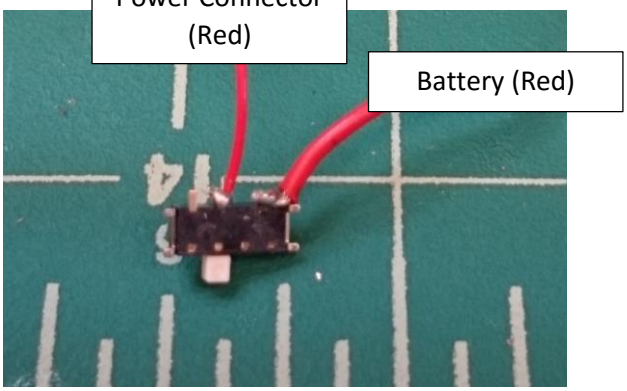
6. Make the Power Connector using below. (Black wire: 1 in , Red wire: 2 in)
   For instruction on making the connector (Ask Mathieu or Lawrence)

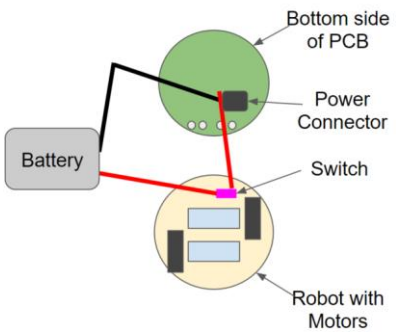




7. Trim the battery wires. (Red wire = 1 ½ in (about ¾ of the original length), Black wire = ½ in (about ¼ of the original length).

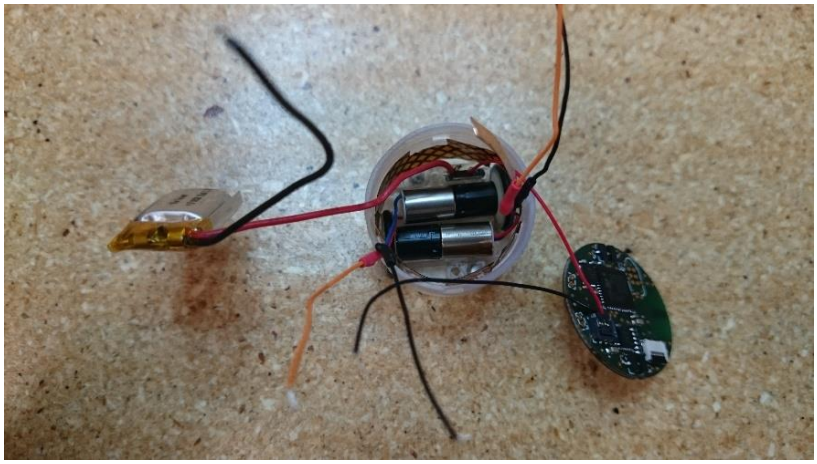



8. Solder the red wire of the battery and red wire from the PCB board onto the switch as shown. And connect the two black wires to each other. (*<u>**Before soldering, add in the heat shrink**</u>).

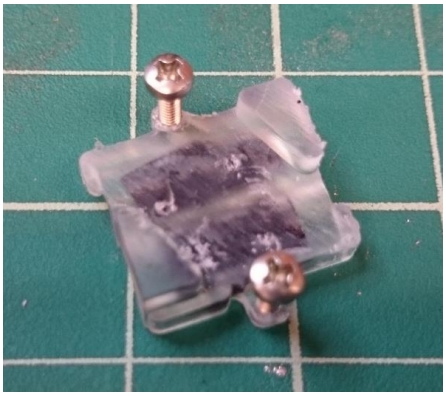




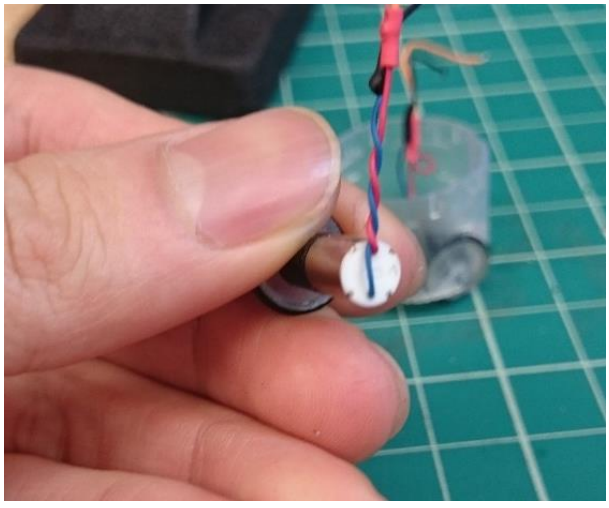
9. Add the wheels (O-ring + 3d printed part) to the motors. If the fit is not very tight, **superglue** the wheels to the motor.
10. Place the motors on the slots of the base and insert the switch into the robot base as shown. (Make sure the switch is in the right orientation, the metal side should be closer to the motors)



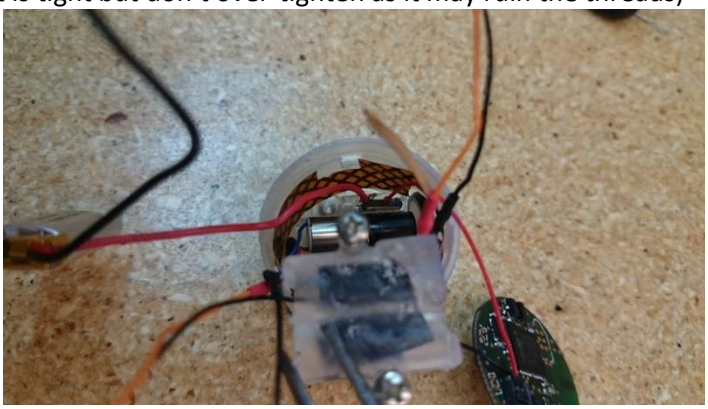
11. Screw in the M2 screws onto the 3D printed motor holder as shown.



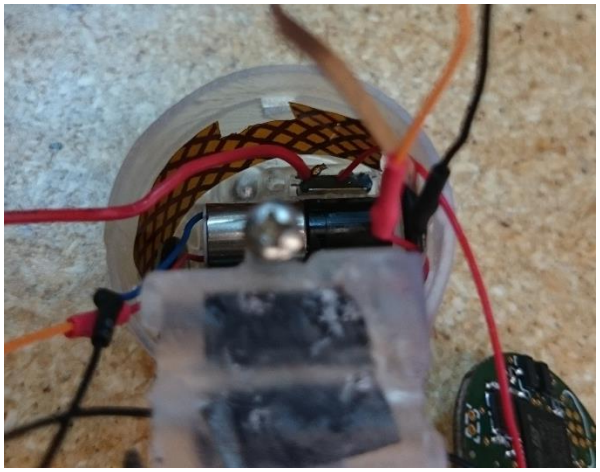
12. Wind the motor wires as below to prevent it from interfering with the other motor. Position the motor so the wires align vertically.



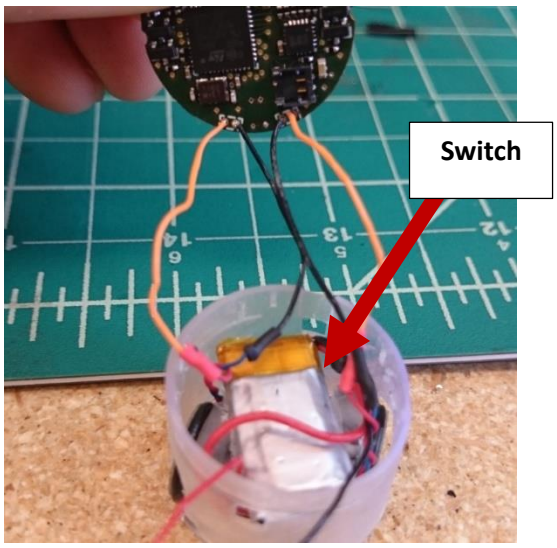
13. Place the 3D printed motor holder + M2 screws on top of the motor and screw onto the robot base. (Make sure it is tight but don't over-tighten as it may ruin the threads)

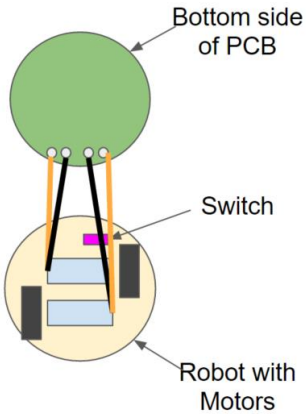


14. Make sure the motor holder is in the right orientation. On the side where the switch is, there should be a slight edge to hold the switch in place.

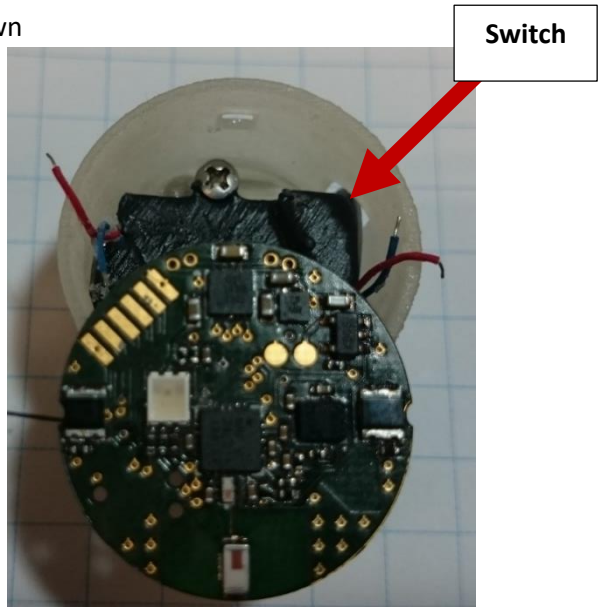


15. Double check that the robot is flat. The robot should be primary resting on the wheels rather than the castor wheels (metal balls).
16. Solder the motor wires onto the PCB board as shown

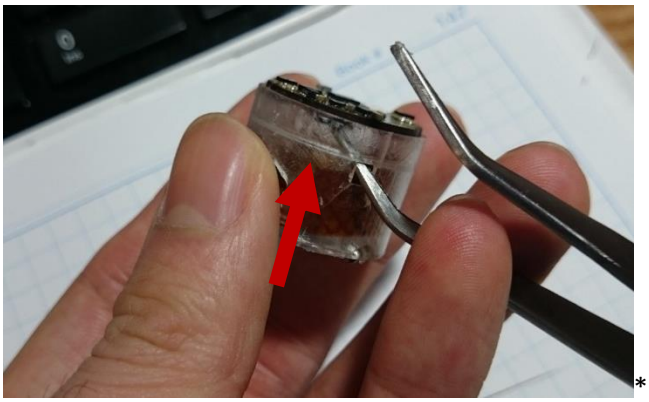




17. Solder ground (black) wires of battery and PCB board.
18. Connect the touch circuit to the PCB board.
19. Place the battery inside and evenly distribute the wires inside such that they are below the PCB chamfer.
20. Place the PCB board as shown



21. Combine the lasercut inner and outer lids and place them on top of the PCB board. Make sure the pads for battery charging are exposed.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**To remove the PCB, use the thin long tool to push it up using the holes on the side.