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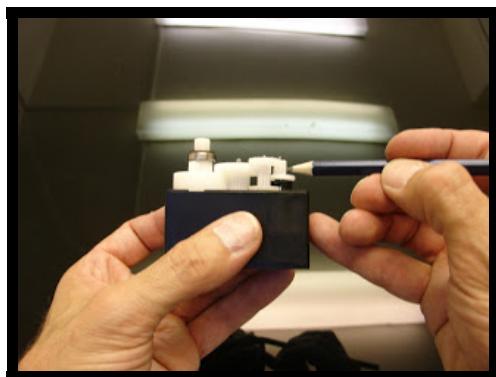
Bicep

Building the bicep of InMoov

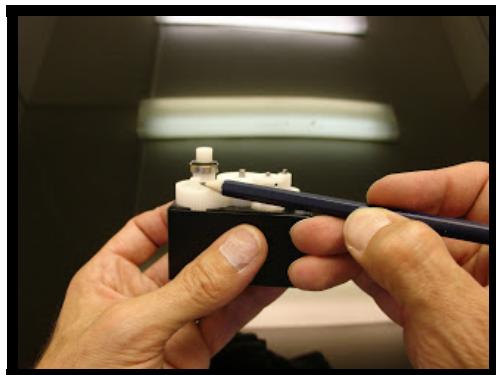
I have tried to make this as simple as I could, and I hope you will find answers to your questions here. Once you have printed the parts you can start the job. On these pictures I was assembling the left arm so take that in consideration if you are building the right arm.

STEP1:

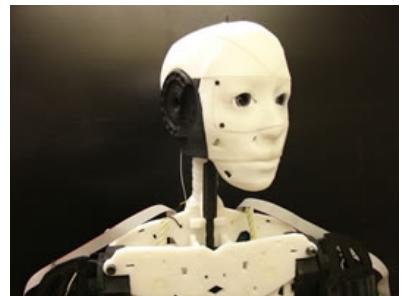
What we want to do in this first tuto is to extract the potentiometer of the 2 servos and adding by welding, extra cable length:



We will start by opening the Hitec HS-805BB servo by unscrewing all the screws at the bottom. It comes apart in three parts. Make sure to work in a clean place, you don't want to lose anything and spoil the grease it contains. Once the top is removed, note or take a picture of each gears placement, check well there are two looking almost alike (shown on picture).



Remove the bearing and its rings(note the order). It can be a little hard to remove it, I used a small screw driver placed under the bearing.



HELP ME EXPERIMENT



SEARCH

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MEMBER ACTIVITIES



Dwayne Williams uploaded a new picture: opencv_fd_1.jpg
17 hours, 58 minutes ago



Rob is standing proud as a test bot for Grog.
He is very pleased to be a part of enhancing the Inmoov Nation.



Fred uploaded a new picture: Possible spring for...
1 day, 16 hours ago



Maybe a possible spring for tendons?

3/3/2014

InMoov » Bicep



Now we want to remove the pcb card and it's motor, on some servos it just came easy, but there is a bit of glue around the motor, so you can push the motor down by pressing the little metal gear placed at the tip of my screw driver.



Aah, it came out, unscrew the potentiometer, for to release it out see next picture.



help yourself again with your small screwdriver placed under the big gear.



Remove the plastic washer(we won't need it anymore, but keep it you never know...)



Jack Phillips posted an update 2 days, 11 hours ago

Head Connect to Torso. Using EZ Robot for programing interface for now. Printing arms and hands next. Not sure how to post video so here is the link.

<https://www.youtube.com/watch?v=czMIEDz9804&feature=c4-overview&list=UUNwlfeOZcu4UbOx3bcqjHQ>

v=czMIEDz9804&feature=c4-overview&list=UUNwlfeOZcu4UbOx3bcqjHQ



Gael Langevin posted an update 2 days, 16 hours ago

To Fred and others:

<https://groups.google.com/group/inmoov/attach/151d3d256a4108f0/spring%20tensioner1.jpg?part=4&authuser=0>

This is how I see a spring added to the retraction tendon. In this set up we avoid forcing on the servo either way of rotation and it also avoid losing tension in the tendons.



Fred uploaded a new picture: 69.jpg 3 days, 17 hours ago



Fred uploaded a new picture: 71.jpg 3 days, 17 hours ago



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gael langevin

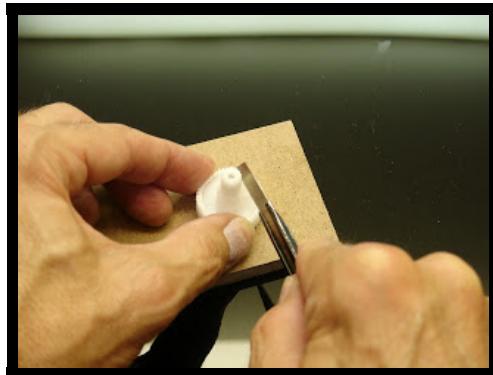
1 circle

413 followers

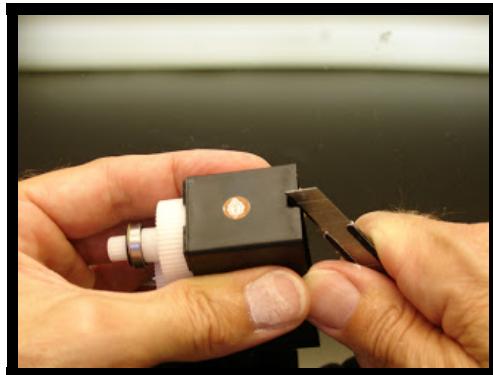
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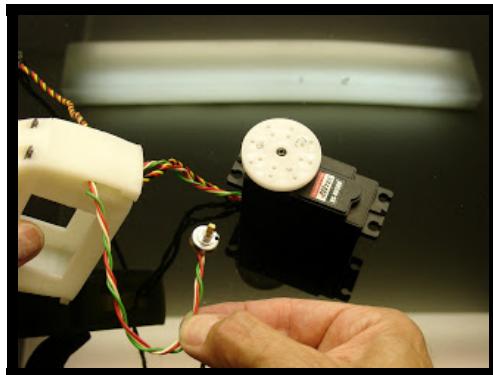
New wiring design for the hand



This is a bit tough, cut the "stopper" with a knife or pliers, BUT DON'T DAMAGE THE GEAR.



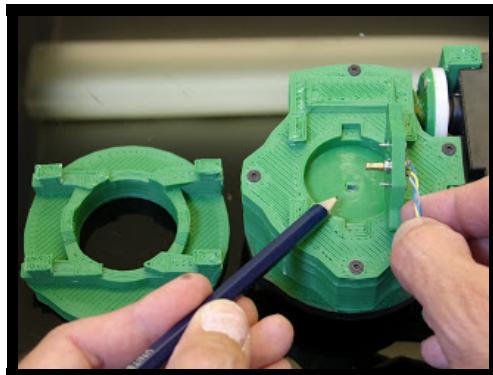
Remount all the gears back in their original place. Arrange with your knife a bigger opening for the extra length cables. When unwelding the cables from the board and the potentiometer note the colors. (I didn't do it with my first servo, answered the phone for ten minutes and when I went back for welding I couldn't remember the colors... Caused damage to the servo permanently, 30 euros in the trash, Aaargh)



Before welding the potentiometer of the low part of bicep, run your cables in the gap of "servoholderV1".

For the low part servo of the bicep, your cables should be welded in the same color order as when you opened the servo. Your cables should be about 25/30 cm long. Now we are set for to assemble the parts.

STEP2:



This picture is to show you what is the angle position of "rotgearV1" compared to "rotmitV1". Check

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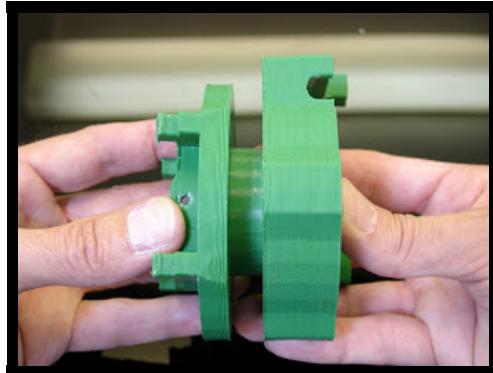
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- Tom on Hand and Forarm
- InMoov » InMoov prosthetic hand almost ready on Default Hardware Map
- Gael Langevin on Hand and Forarm
- Tom on Hand and Forarm

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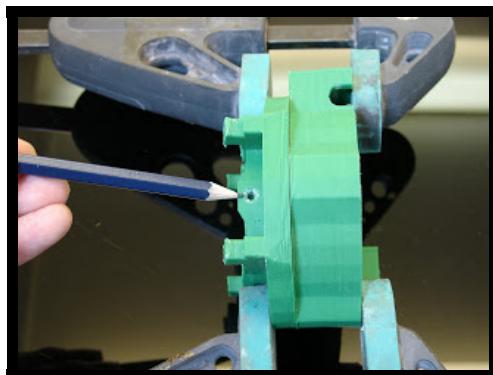
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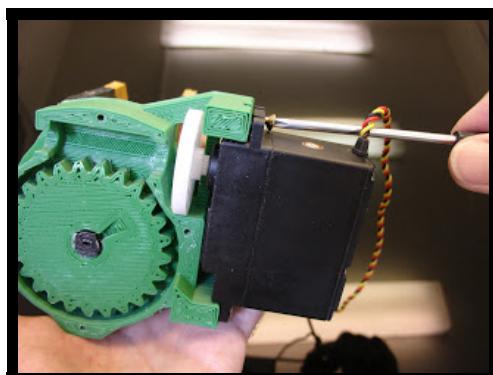
the little rectangle hole.



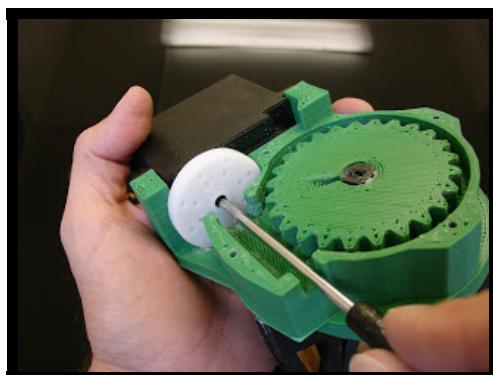
So keeping the same rotation angle, mount "rotmitV1" to "rotgearV1". (Don't refer to this picture for the angle, parts you've downloaded aren't the same anymore)



I used clamps to make sure there wouldn't be backlash between all three parts during screwing them.
Make sure your screws don't come out behind, or recut them. (Don't refer to this picture for the angle, parts you've downloaded aren't the same anymore)



Attach one servo to "rotcenterV1". For to do so: mount but don't tight fit the white actuator wheel.



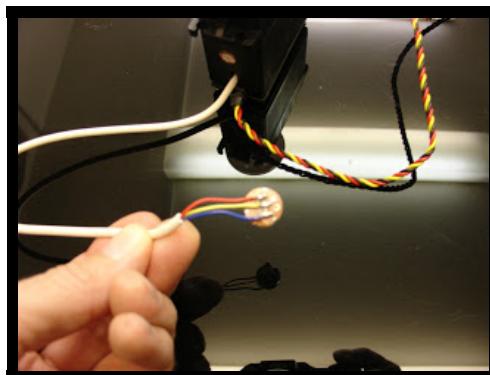
Once the servo is attached, you can tight the screw.



Mount "rotwormV4" to the actuator with 4 little screws, make sure they don't come out behind the actuator, otherwise you have to cut them. Mount "rotgearV2" to "rotcenterV2", it should turn easily but with no backlash. I made it operate a few turns by plugging the servo on the Arduino. Then I cleaned up the dust created by the parts. Before closing the case with "rotTitV1", use a good amount of grease, every where on the gears.



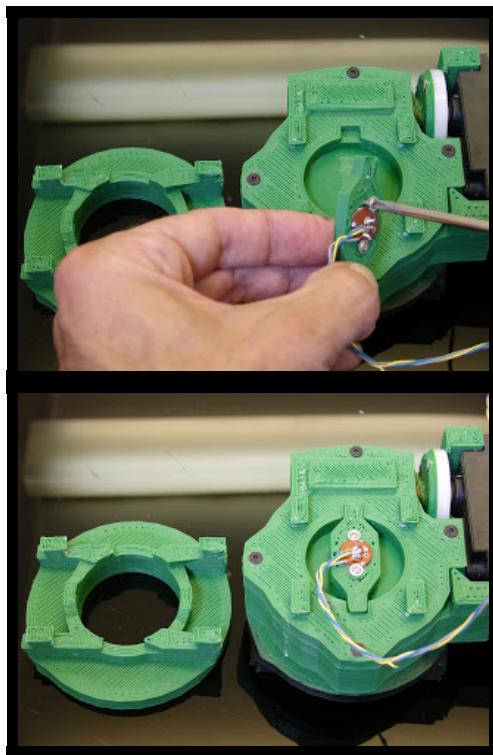
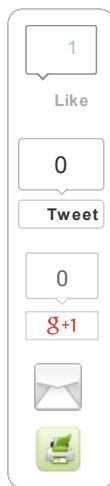
If you are building the left ROTATE arm, your cables should be welded in the same color order as when you opened the servo.



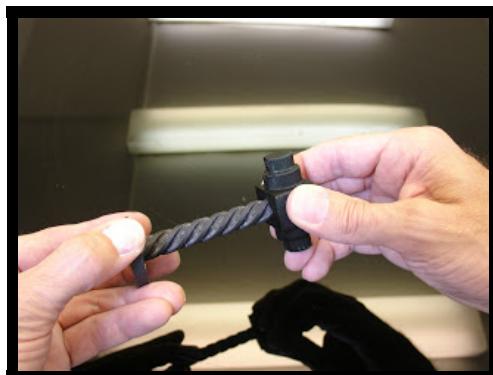
If you are building the right ROTATE arm, your cables should be welded in the opposite color order as when you opened the servo.



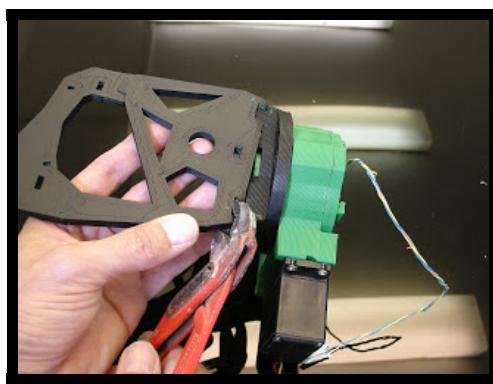
Mount the potentiometer to "rotpotentioV2" but make sure to place the little metal plate from the potentiometer in the gap designed in "rotpotentioV2". Use some little spare screws from your small servos.



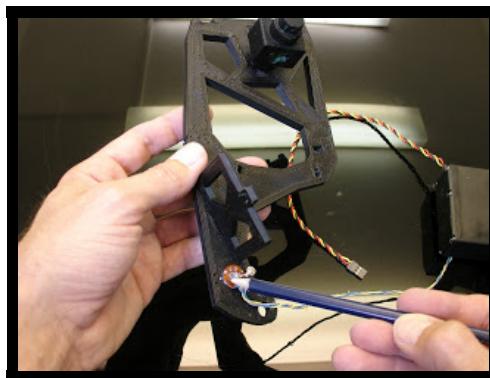
PS: "rotmitV2 was not supposed to be standing on the left on three above pictures, since you already have mounted it..."



Ease "pistonanticlockV1" in to "pistonbaseV1". I have reinforced "pistonanticlockV1" on the inside with a metal rod. But you can use it like this, it should hold. I broke a few of them during my tests, and was glad they could break instead of something else.



Assemble "higharmV1" to "rotmitV1", use pliers , with ABS it just fit perfectly, I felt like playing with Lego's. Make sure you have the same position then on the picture.



Add "pistonbaseV1" and "spacerV1". Attach the potentiometer, again make sure to place the little metal plate from the potentiometer in the gap designed.



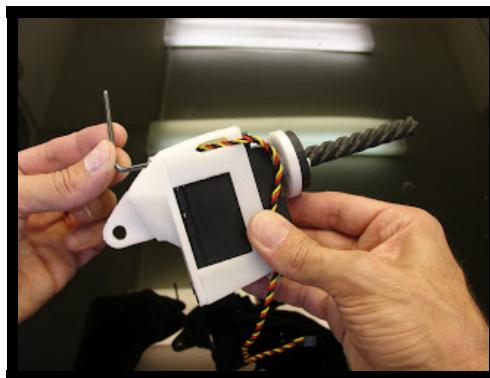
Assemble the rest of "higharmV1" and "lowarmV1". Later, after your tests, you will have to glue those parts.



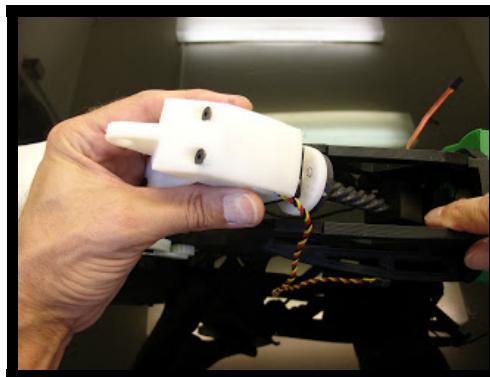
Attach the servo in the "servoholderV1".



Run the cables as shown.

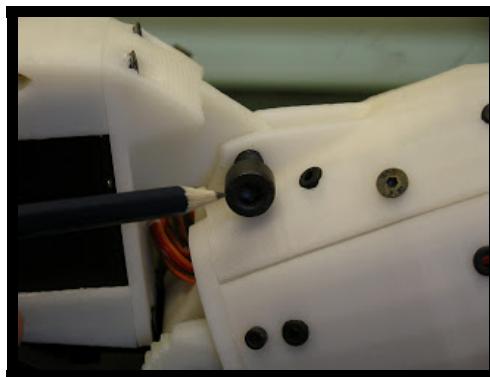


Attach the "servobaseV1", and "pistonanticlockV1" to the actuator.

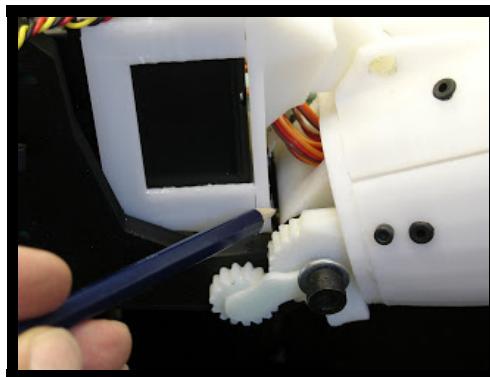


Turn in "pistonanticlockV1" in to "pistonbaseV1". Adding grease is a good idea.

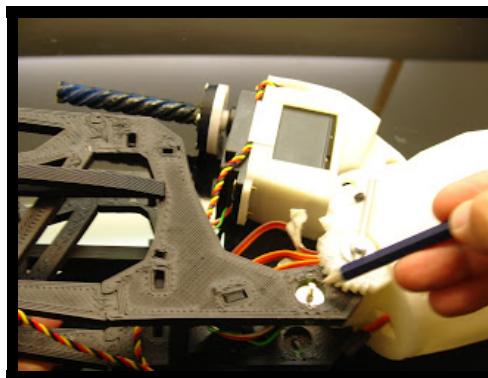
So I assume here you already have glued "[elbowshaftgearV1](#)" to "robcap3V1". So you also have attached the forearm to the bicep. Good.



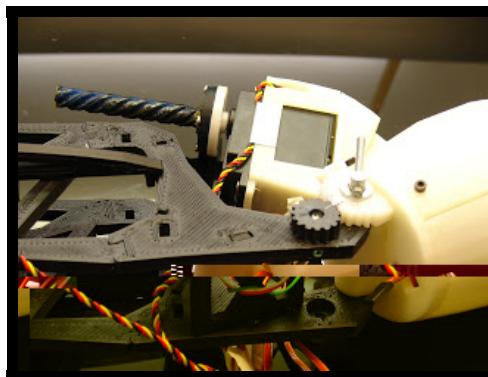
Here comes the part the most difficult for me to explain. Now lean down "servobase" and attache it to the forearm.



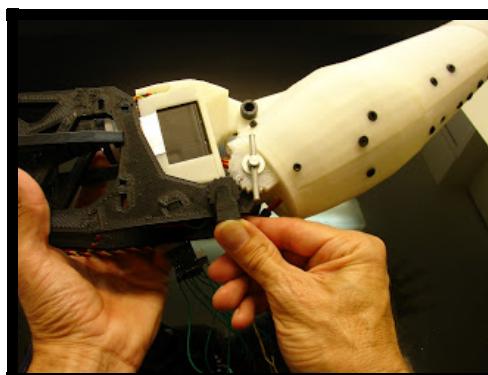
You should KEEP a gap at it's base, this is going to be your 0° degree position. Fix or mark the whole arm in this position, it is important not to lose it during the next steps.



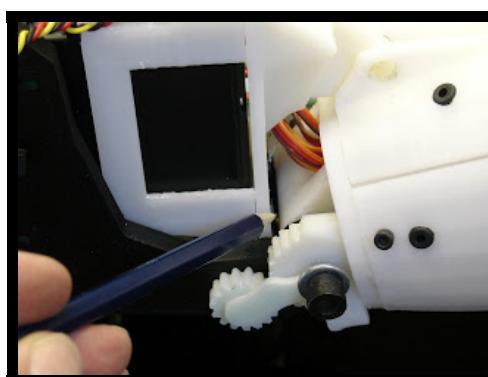
Unmount the servo gun. Plug your servo to the Arduino board, and run a sketch to get the 0° position of your servo, it will rotate continuously. Now turn by hand the potentiometer until the servo stops turning. This is your 0° degree position.



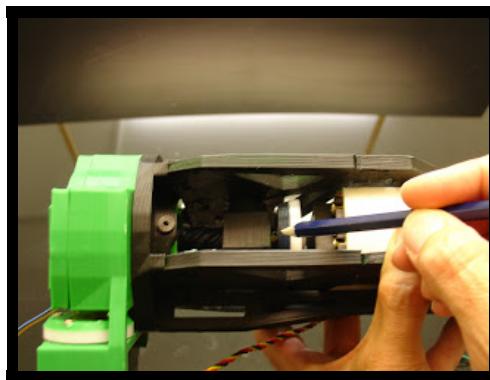
Mount the "potentiogearV1" on the potentiometer, making sure the arm and the potentiometer don't move.



Clip in the "gearholderV1". There should not be backlash between the two gears. Keep the servo gun unmounted and make a test with your Arduino like previously to 0°degree. You can move the arm slowly by hand to closed position and open position to check everything is okay. Remount the servo gun.



Big moment now. Rerun the test to 0°degree. The arm should open keeping the gap previously seen at the base. If not it will break the "pistonanticlockV1".



Make another test from 0°degree to 60°degree. Check the space left between "pistonanticlockV1" and "pistonbaseV1". My arm can go up to 90°, but be carefull that all depends on the gap you have set. So try 10° by 10°degrees. Remember when writing your sketchs to never go further then the best result you got.

Now you can make a test with the servo attached to "rotcenterV1" going to 90°, that will be the "rest" position of the arm when it will be attached to the coming shoulder.

Normally you should be all set. Hope this helped because it took me a lot of time to do this tuto 😊

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