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Finger Starter

Assembly

the “Finger Starter”

This is great news for us who are used to buy expensive servos. The Arduino Uno even if it is not the best power supply you can see [HERE](#). These connections drawing are mainly for the whole hand.

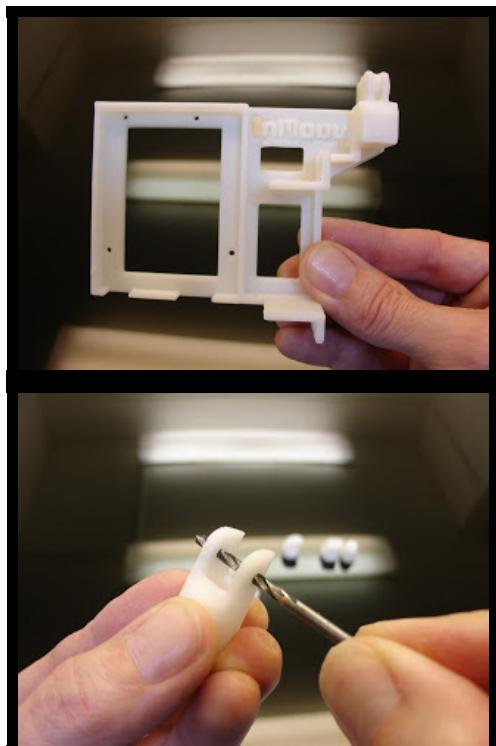
The pull cord is not strong enough on this tuto is a fishing nylon, but it is not what works the best because it tends to stretch.

interesting to connect a finger to a small servo for testing it with an Arduino board. The servo I used here is a digital HK15298 but you can use also a cheap analog MG995 or even a standard servo if the size specifications are the same.

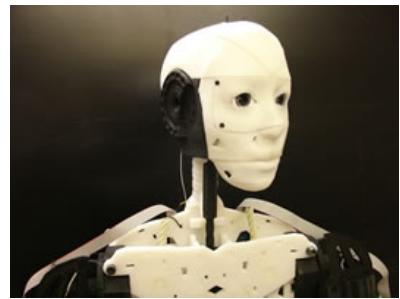
used here is an Arduino Uno. It is best to add an external power supply because they are small they draw too much current which will overheat your board. If you have a better power supply you can see [HERE](#). These connections drawing are mainly for the hand, they are the same for one servo/finger or for five.

The pulley used in this tuto is a fishing nylon, but it is not what works the best because it tends to stretch. I recommend for InMoov, fishing braid 200LB. But for this test you can use anything you have at hand as long as it can pull and is thin enough to let the finger curl.

Now let's see what we have printed and how we are going to do that.



Redrill the sides hinges holes with a 3mm drill.



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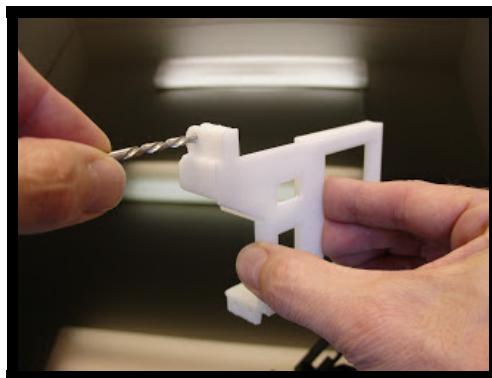
Rob is standing proud as a test bot for Grog. He is very pleased to be a part of enhancing the Inmoov Nation.



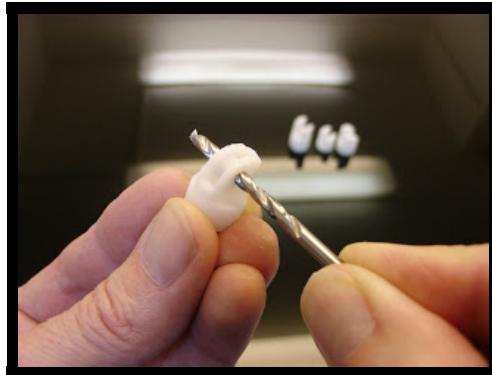
Fred uploaded a new picture: Possible spring for...
1 day, 16 hours ago



Maybe a possible spring for tendons?



The inside hinges holes should be redrilled with a 3.5mm drill.



So the inside hinges of the finger should also be done with a 3.5mm drill.



Note the finger parts have numbers printed for a easier assembly.



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>



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.



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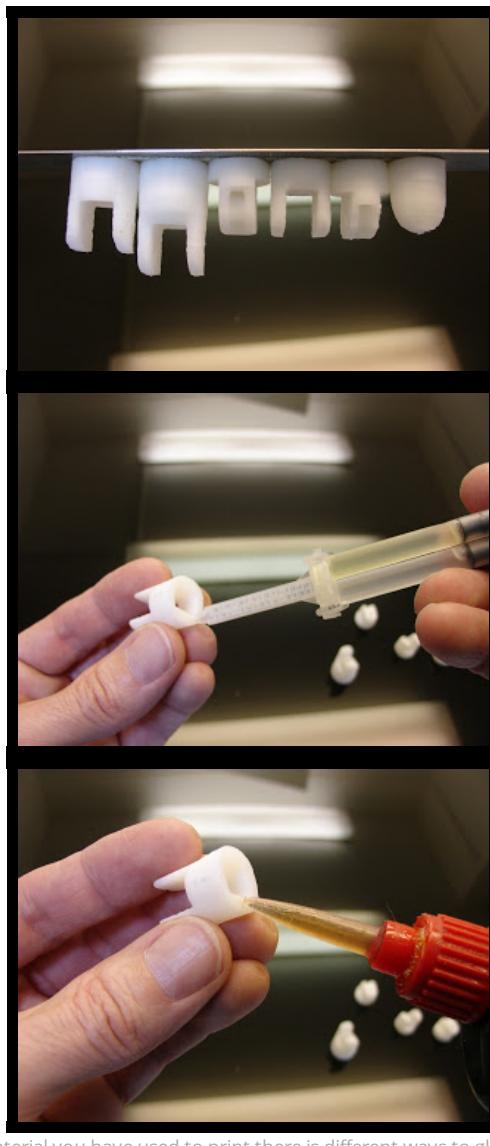
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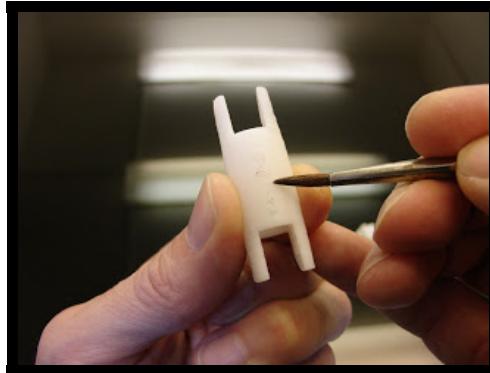
[New wiring design for the hand](#)

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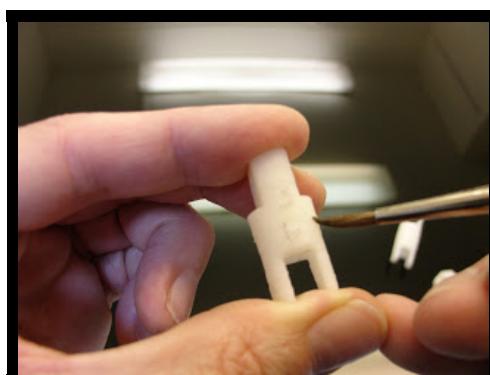
Gael Langevin on Hand and Forarm



Depending on the material you have used to print there is different ways to glue the parts together. If you have PLA prints, a two components epoxy glue is really good but you can also use UHU glue. If you have printed in ABS, you can use epoxy, UHU glue but what works the best is acetone.



Applying few drops of acetone will link dissolve the parts together like it was printed in one piece. So take part 1 and part 2 and glue them together.



Tom on Hand and Forarm

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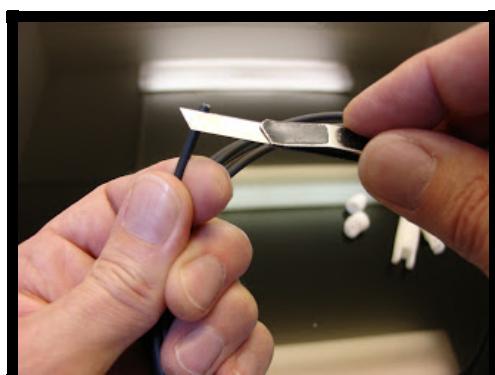
Glue together part 3 and 4.



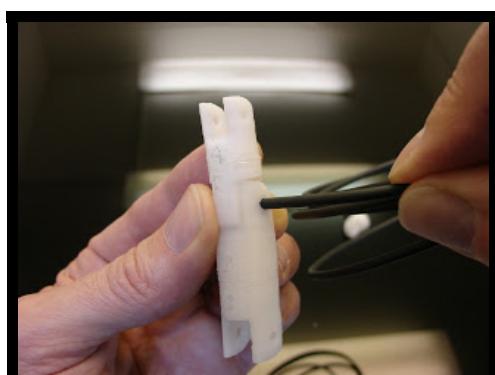
Don't glue yet parts 5 and 6



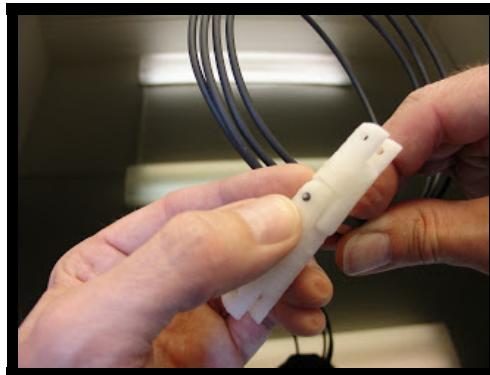
Take a piece of your 3mm filament, if you don't have that you will need to get some screws of 3mm at your hardware shop.



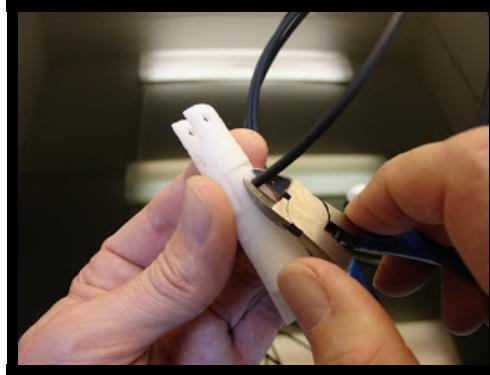
Get it trimmed with a cutter knife.



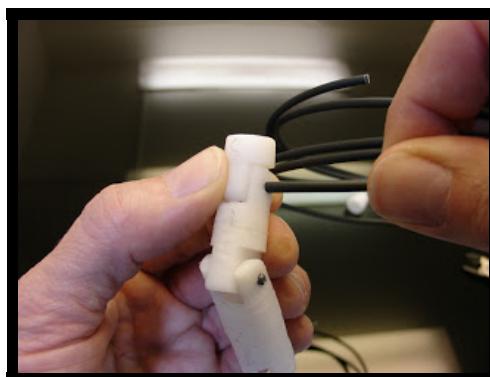
Push it in the hole, assembling part 1/2 to 3/4 together.



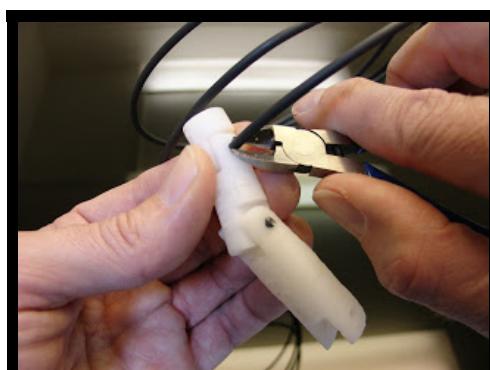
Once it reaches the other side,



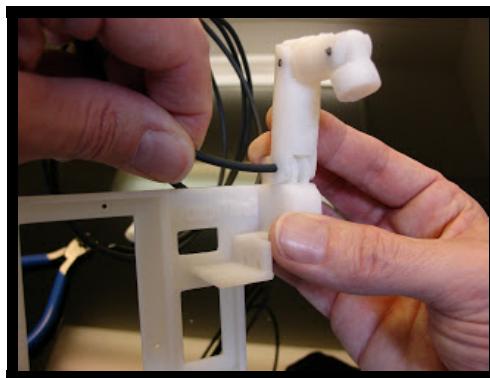
cut the filament with pliers.



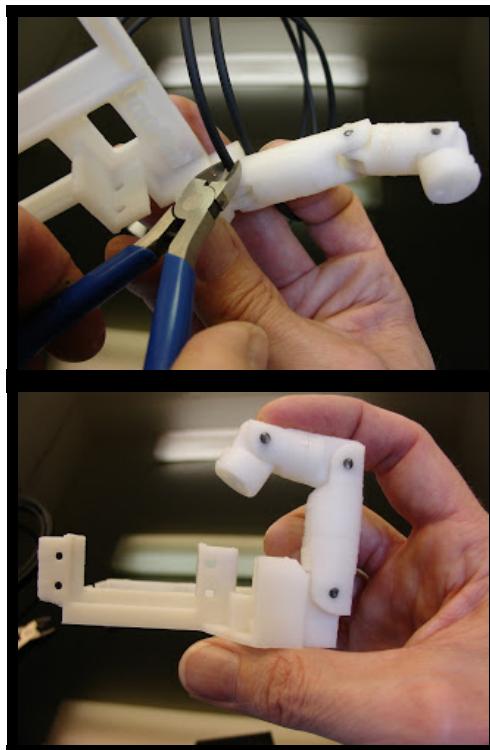
Do the same trick with parts 3/4 to 5



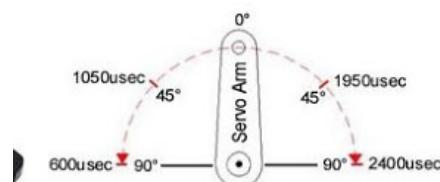
Now we have a finger that should move freely.



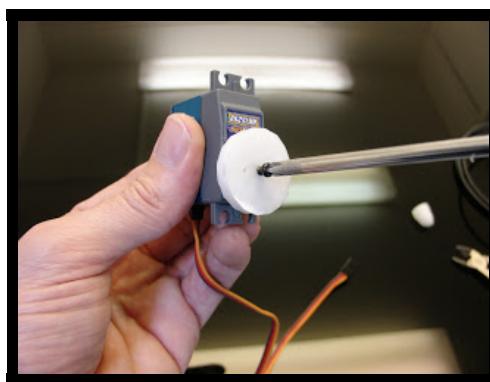
Assemble the finger to the main part with the same technique.



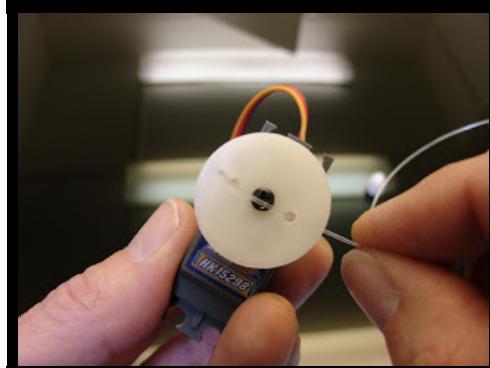
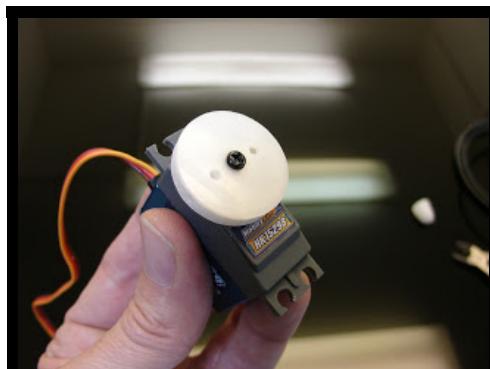
You should have something like this. It should be able to freely fold to this angle.



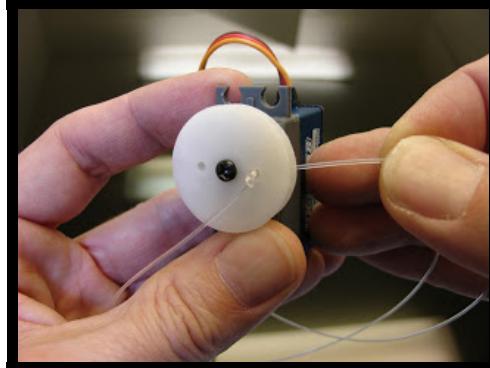
Now lets hack the servo. We are going to find an arbitrary zero point on the servo. Turn by hand the actuator to the maximum left, note until where it goes. Do the same to the left and note until where it went. These two points are the extremes positions of your servo, in the middle of these two points decide where is the arbitrary zero point. You can find that with your arduino board if you know how to do it, but this is a simple solution for now even though it isn't precise.



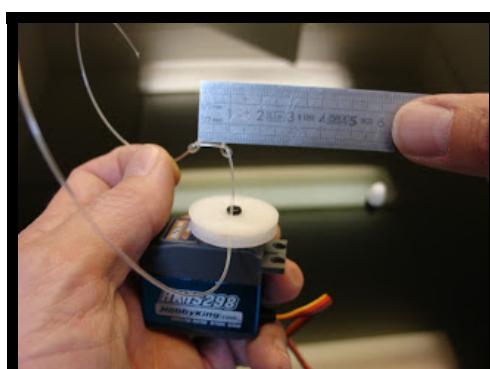
Mount, Screw the "RobRing" on your servo, the two little holes should be on your extreme points.



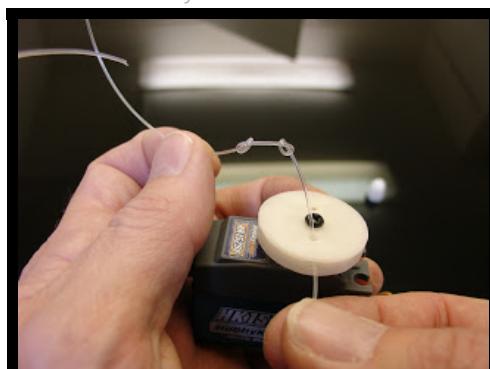
Take a piece of rod of about 50cm long. Run your rod through one hole.



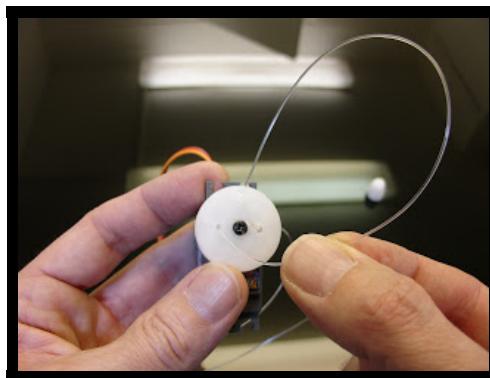
Make two knots at approximatly 25cm of your rod, like this. make them well tight.



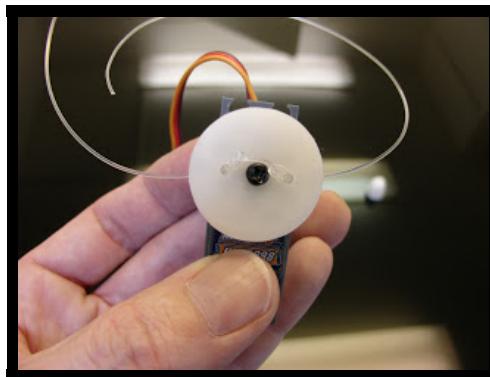
Add another set of knots about a 1cm away from the first set.



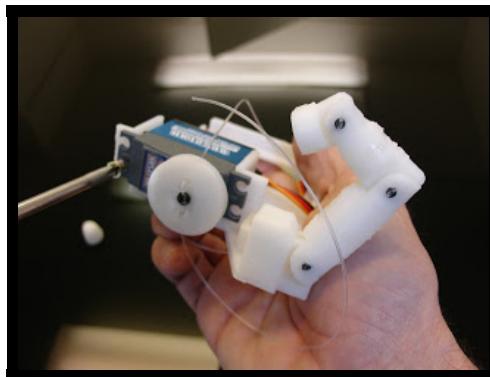
On my picture I did only two knots like this, but they might run through the hole of "RobRing" and that shouldn't happen. Adding a bunch of knots will help to avoid that.



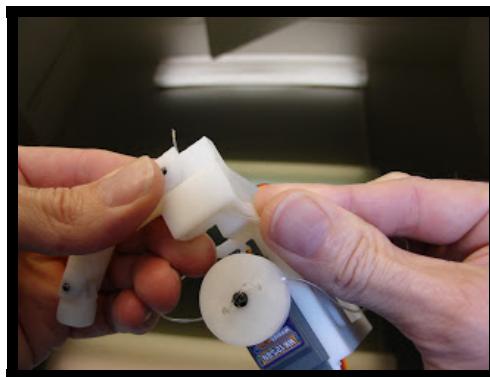
Now run the other end of the rod through the second hole.



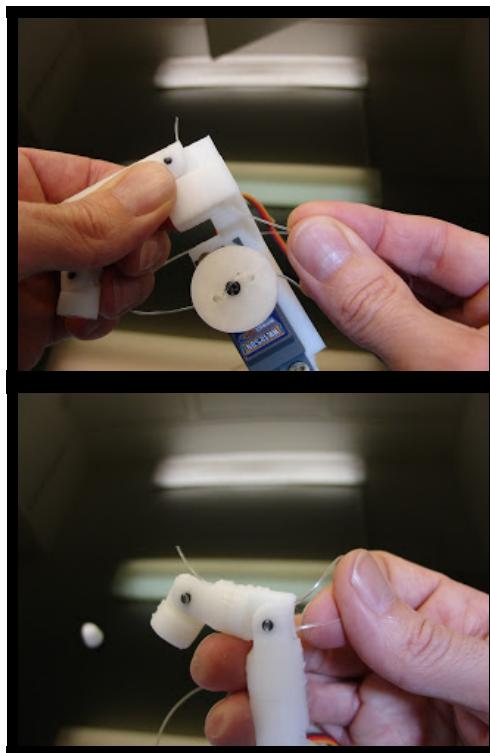
You should have something like this, with even more knots than me.



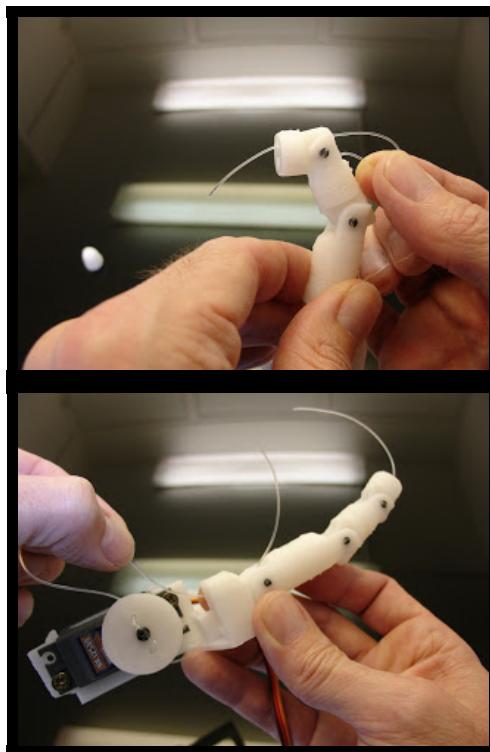
Time to fix the servo to the base.



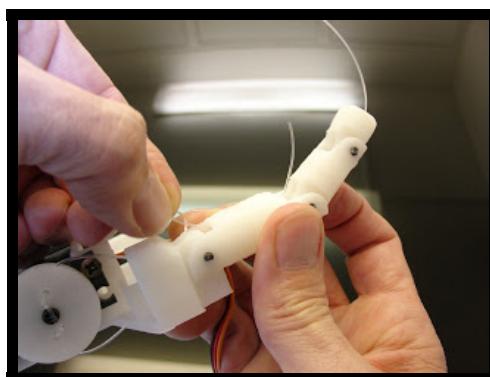
Run the bottom rod through the parts like on the following pictures.

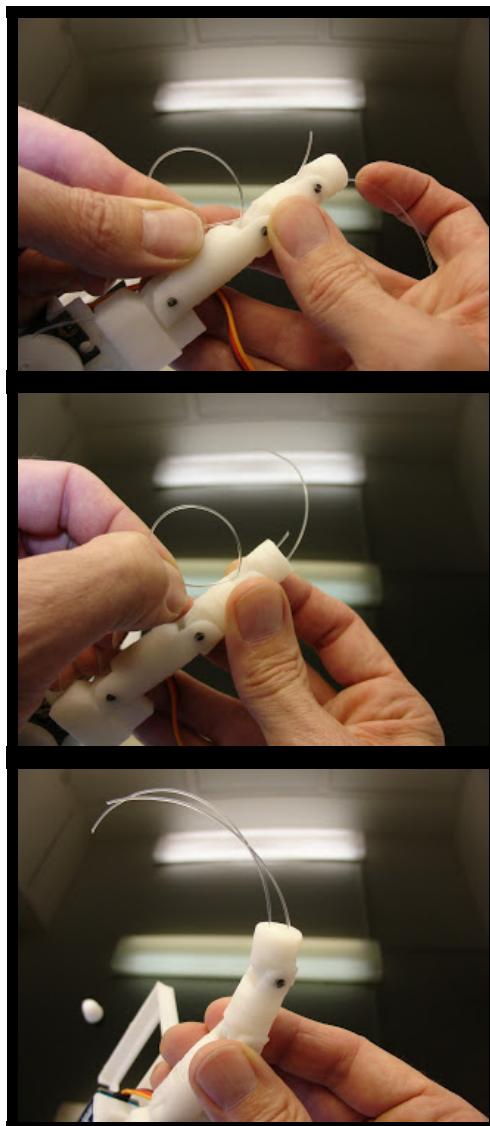


Just make sure not to invert your rod, it should always on the back of the finger.

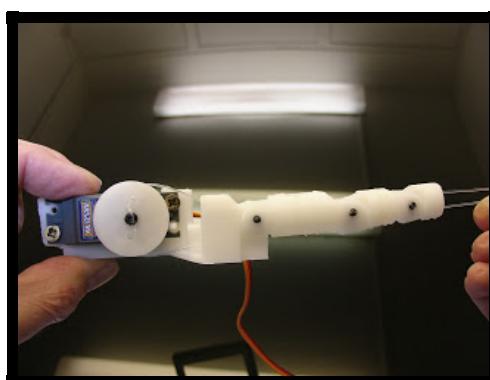


Now run the second rod on the inside of the finger.

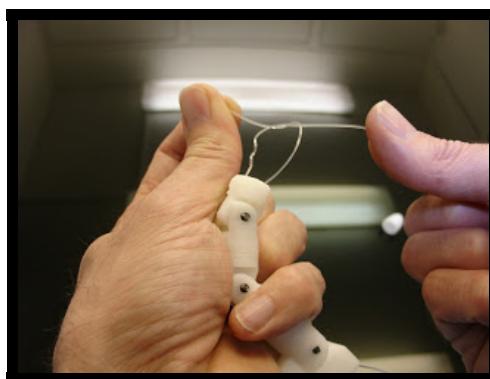




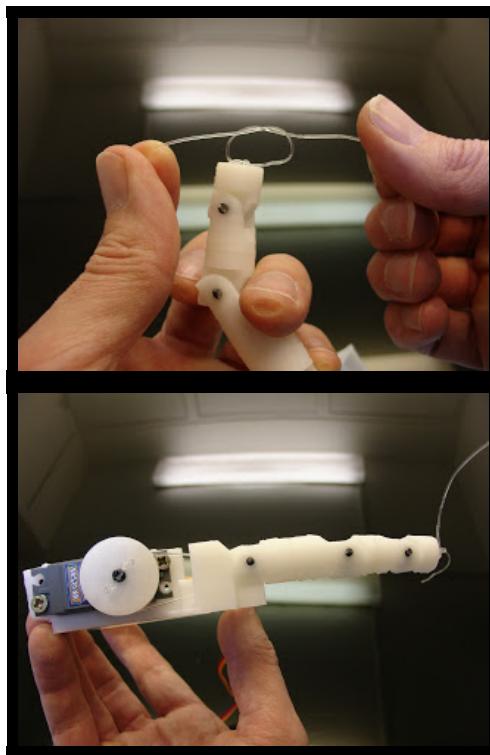
You should end up like this.



Check your servo is at his zero arbitrary point.



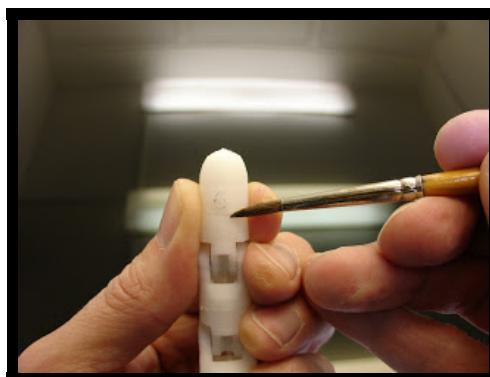
Curl a little bit the finger and make a few knots between the two wires.



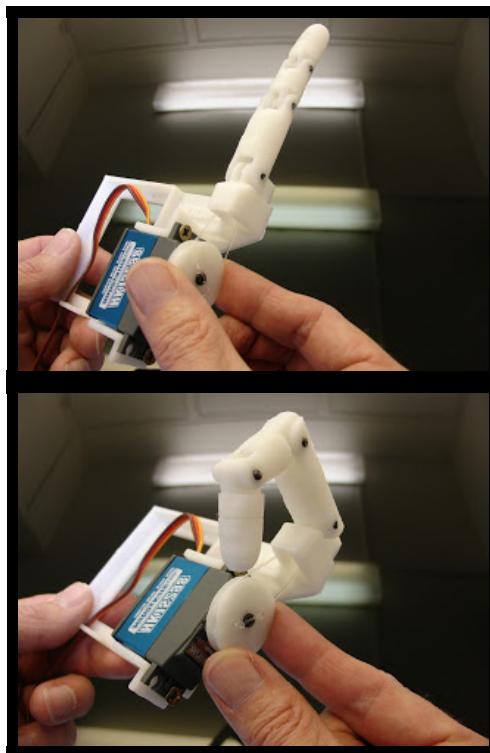
When turning "RobRing" by hand you should be able to get the finger in this position. Finger totally stretched.



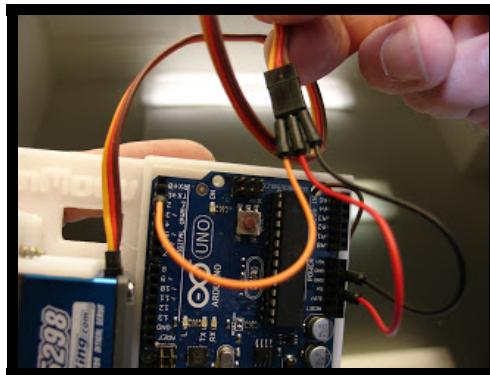
Now cut the rods.



Glue part 6 to 5. If you look close at part 6, there is a nail side, and I haven't put the number on the nail for aesthetic reasons.



Try to move the finger by rotating "RobRing", it should move freely without locking.



Insert the Arduino board and make a wire connection like this. Orange or yellow to pin3 on PWM. Red on +5V. Black or brown on Gnd (ground).

Okay at this point Grog is doing a basic InMoov starter service, and is not ready with it, hopefully it will very soon. Be patient this is all done on our free time. But you can follow this [tutorial](#) to get started with Myrobotlab. Things have changed a bit since I wrote it but it helps to understand the basics.

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