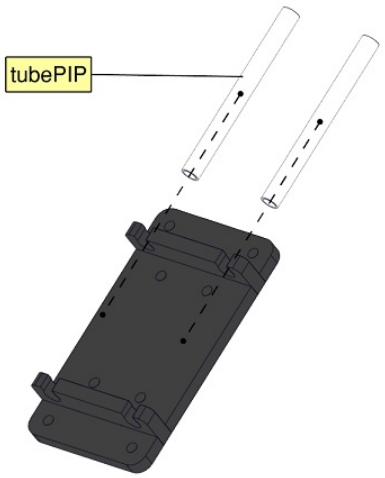
6 Fingers Assembly

This section contains instructions for assembling all 5 fingers of the prosthetic hand. Before each assembly step, a table containing all required materials and tools will be provided for convenience.

6.1 Assembling the Phalanges

Part List 6.1.1	
Part Name	**Qty**
index	1
middle	1
ring	1
pinky	1
thumb	1
tubeMIP	8
tubePIP	10
tubeDIP	10
Materials	
Super Glue	

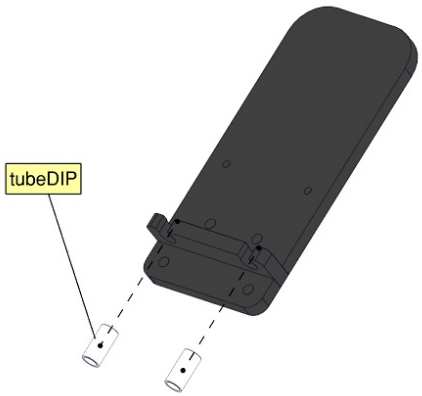
Board 6.1.1: Assembling PIP/MIP Phalanges



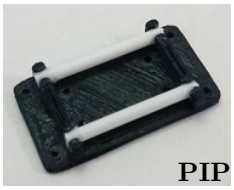
1. Insert the low friction tubes to the tubePIP/tubeMIP plates.
2. Glue the edges of the tubes to the tube plates with super glue.

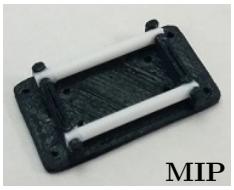
Board 6.1.2: Assembling DIP Phalange

1. Insert the low friction tubes to the tubeDIP plate.
2. Glue the edges of the tubes to the tubeDIP plate with super glue.



Board 6.1.3: Completed Phalanges


PIP


MIP


DIP

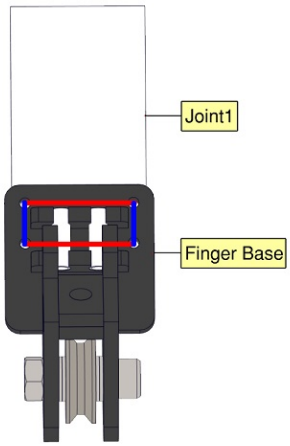
6.2 Attaching the Phalanges on the Flexure Joints

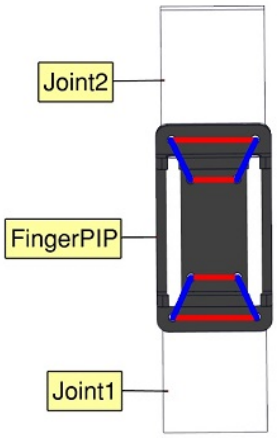
The flexure joints of each finger are implemented with silicone sheets, attached to each pair of neighboring phalanges via simple stitching with nylon fishing line and long needles as shown in the following assembly steps.

Part List 6.2.1	
Par Namet	**Qty**
index	1
middle	1
ring	1
pinky	1
thumb	1
Joint DIP & MIP	4
Joint PIP	5
Tools	
Long Needles	
Nylon Fishing Line	
Cutter	
Long-Nose Pliers with Side-Cutting	
Precision Ruler	
Scissors	

Board 6.2.1 displayes an overview of the stitching patterns. The red lines denote stitching that passes from both sides of the rigid part and the flexure joint, while the blue lines depict a fishing line that passes only from the lower side of the flexure joint.

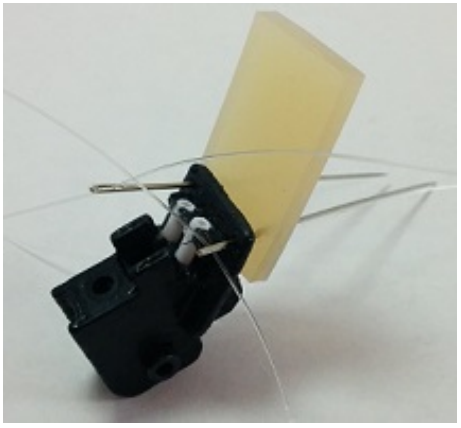
Board 6.2.1: Phalange/Joint Attachment Overview





The stitching steps are illustrated in the following figures.

Board 6.2.2: Stitching Step I



(1) Cut 450mm of fishing line.

(2) Pass the fishing line through the eyes of the needles.

(3) Insert the needles into the upper, and outer slots of PIP.

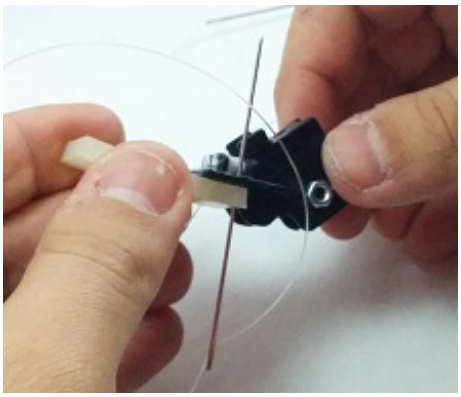
Board 6.2.3: Stitching Step II

(1) Pass each needle through the eye of the other.

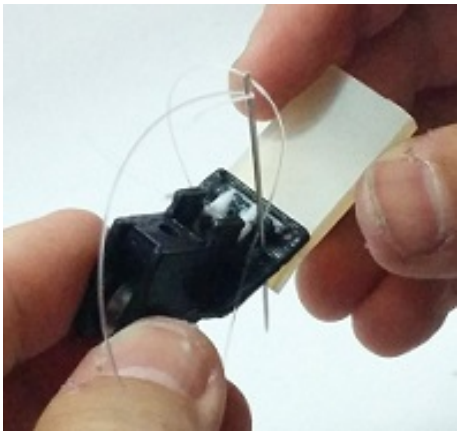
(2) Repeat step (1) twice.

(!) The needles are now in the lower side of MIP.

(3) Insert the needles into the inner slots of MIP.



6.2.4: Stitching Step III



(1) Pass each needle from the eye of the other.

(2) Repeat step (1) 3 times.

(!) The needles are now in the lower side of MIP.

Board 6.2.5: Stitching Step IV

(1) Remove the needles from the fishing line.

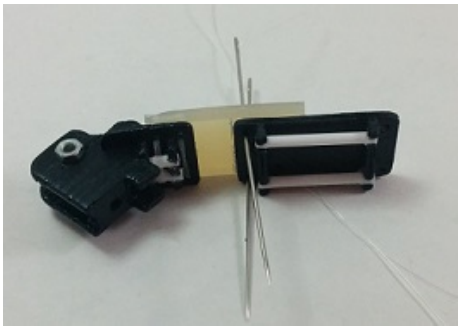
(2) Tie the ends of the fishing line with multiple surgeon's knots.

Board 6.2.6: Stitching Step V

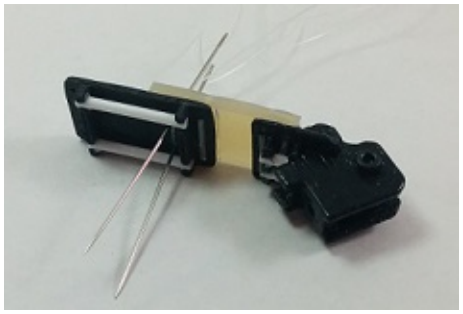
(1) Cut 450mm of fishing line.

(2) Pass the fishing line through the slots of two long needles.

(3) Insert the needles in the lower, outer holes of PIP.



Board 6.2.7: Stitching Step VI



(1) Pass each needle through the eye of each other.

(2) Repeat step (1) 3 times.

(!) The needles are now in the lower side of PIP.

Board 6.2.8: Stitching Step VII

(1) Insert the needles into the inner, lower slots of PIP.

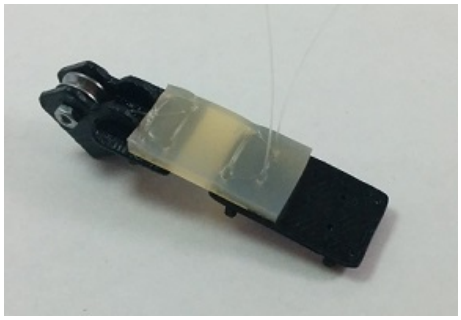
(2) Pass each needle through the eye of each other.

(3) Repeat step (2) 3 times.

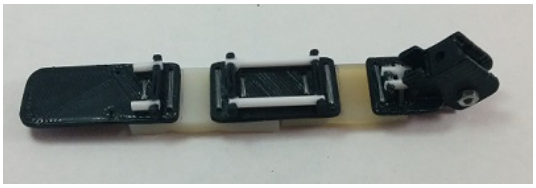
(!) The needles are now in the lower side of PIP.

(4) Remove the needles from the fishing line.

(5) Tie the ends of the fishing line with multiple surgeon's knots.



Board 6.2.9: Completed Finger



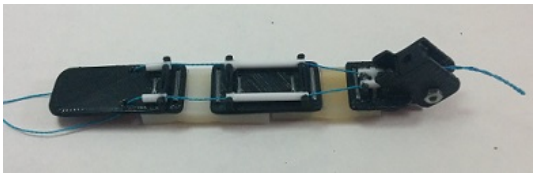
(1) Repeat steps 6.2.5 - 6.2.7 for DIP.

(!) Congratulations, you built a finger!

6.3 Tendon Routing System Assembly

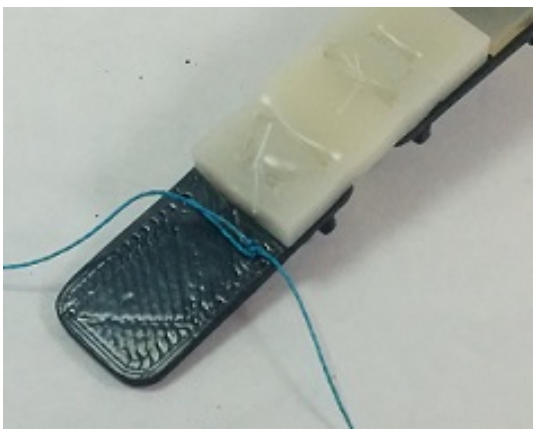
Part List 6.3.1	
Part Name	**Qty**
index	1
middle	1
ring	1
pinky	1
thumb	1
Tools & Materials	
Scissors	
Dyneema	

Board 6.3.1: Passing the Dynema from the Phalange Tubes



1. Cut 600mm of fishing line.
2. Pass the Dyneema through the phalange tubes starting from PIP.

Board 6.3.2: Fixing the Dynema on the Fingers



1. Tie the ends of Dyneema with multiple surgeon's knots.

6.4 Attaching the Soft Fingetips on the Fingers

Parts List 6.4.1	
Part Name	**Qty**
index	1
middle	1
ring	1
pinky	1
thumb	1
Tools & Materials	
Scissors	
Self-Adhesive Tape	
Deformable Spong-like Tape	
Anti-Slip Tape	

Board 6.4.1: PIP Inner Coating

1. Cut two pieces of sponge-like tape to the size of PIP.
2. Attach the tape pieces on PIP.

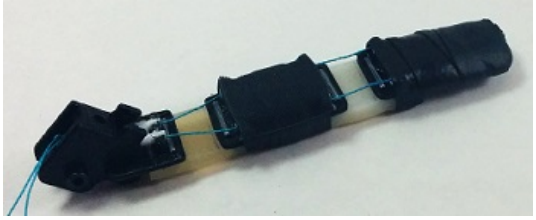
Board 6.4.2: Fixing PIP Coating

1. Cut 130mm of self-adhesive tape.
2. Wrap the tape around PIP.

Board 6.4.3: DIP Inner Coating

1. Cut two pieces of sponge-like tape to the size of DIP.
2. Attach the pieces on DIP.

Board 6.4.4: Fixing DIP Coating



1. Cut 200mm of self-adhesive tape.
2. Wrap the tape around the DIP.

Board 6.4.5: Anti-Slip Coating

1. Cut a piece of anti-slip tape to the size of PIP.
2. Attach the tape on PIP.
3. Cut a piece of anti-slip tape to the size of DIP.
4. Attach the tape on DIP.
5. Cut the edges of the tape.