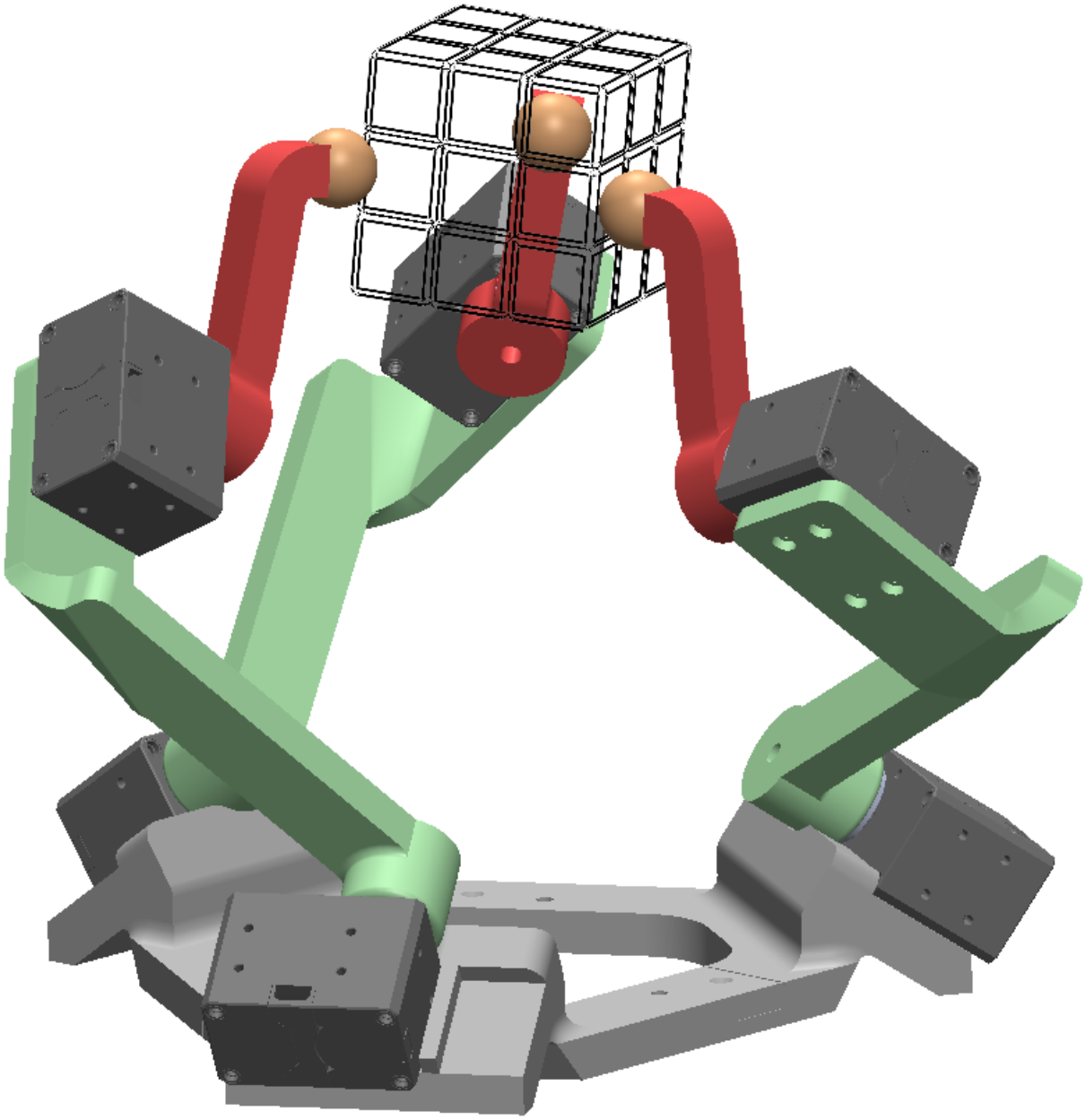
OpenHand

Sphinx Hand

Version 1.0

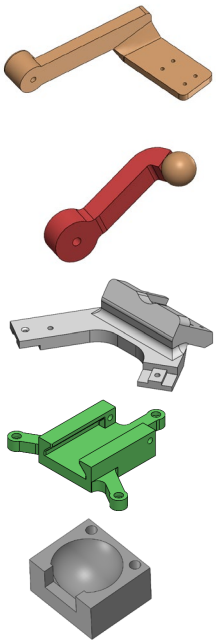


Assembly Instructions

Last updated: April 25, 2025

Custom Parts

Part Name	Usage	Fabrication	Qty
Link1_xl430	Finger link 1	3D print	3
Link2_xl430	Finger link 2	3D print	3
Base	Finger base	3D print	3
DovetailToBottom	Dovetail mount	3D print	1
MoldHalf_Sphere	Fingertip casting mold	3D print	6



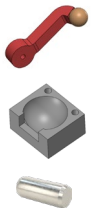
Off-the-Shelf Parts

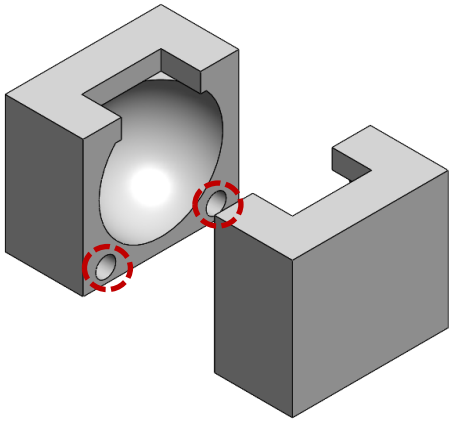
Part Name	Quantity	Description	Vendor
4-40 7/16" long flat head screw	6	Fasteners	McMaster [92210A109]
4-40 tapered heat-set inserts	6	Heat set insert	McMaster [93365A120]
1/8" dia, 5/16" long dowel pin	6	Dowel pin	McMaster [90145A878]
Dynamixel XM-430 W350-R	3	Rotary servo	Robotis [link]
Dynamixel XL-430 W250-T	3	Rotary servo	Robotis [link]
USB2Dynamixel or U2D2 adapter	1	Servo adapter	Robotis [link]
Dragon Skin 30 silicone	1	Finger pad rubber	Smooth-On [link]

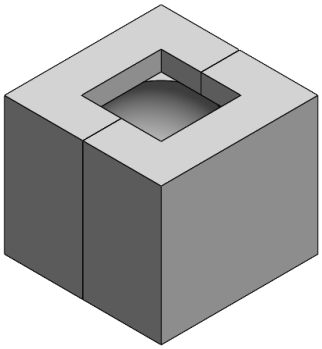
Fingers

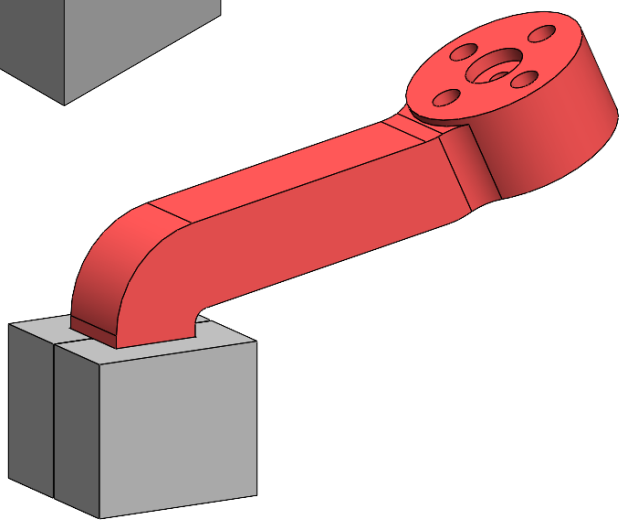
Fingertip Silicone Molding

Parts
Link2_xl430 (x3)
MoldHalf_Sphere (x6)
1/8” dia 5/16” long dowel (x6)
Dragon Skin 30 silicone









Insert the Ø1/8” dowel pins in the holes marked by the dotted red circles on *one* of the MoldHalf_Sphere parts. These pins will be used to align the two halves of each mold. Depending on the print tolerances, the holes for the dowel pins may have to be reamed to be able to press fit them in. The holes on the other MoldHalf part without the dowel pins can also be drilled to provide a clearance fit for the dowel pins.

The two MoldHalf parts can now be pressed together with the alignment dowels. Clamp them together to reduce any leakage or secure them with rubber bands. Prepare 3 such molds for the 3 fingers.

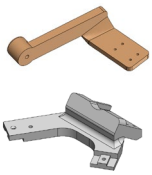
Fill all three molds just till the silicone overflows the top of the mold. Gently press the Link2_xl430 printed part into the silicone mold. Place any supports needed to prevent the finger from slipping out of the mold during curing. Leave the silicone to cure for up to 24 hours.

Repeat three times, once for each finger.

Fingers

Finger Subassembly (1/2)

Parts
Link1_xl430 (x1)
Base (x1)
4-40 tapered heat-set inserts (x2)
Dynamixel XM-430 W350-R

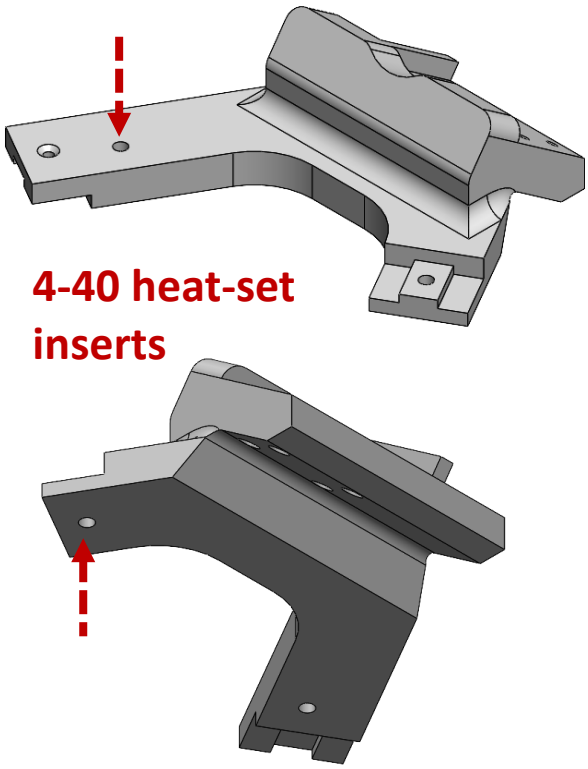


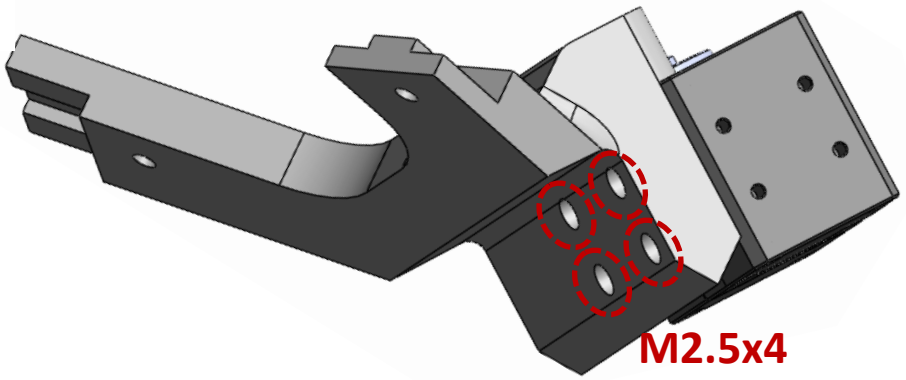
Now we will assemble one of the finger subassemblies. Repeat these steps three times, once for each finger.

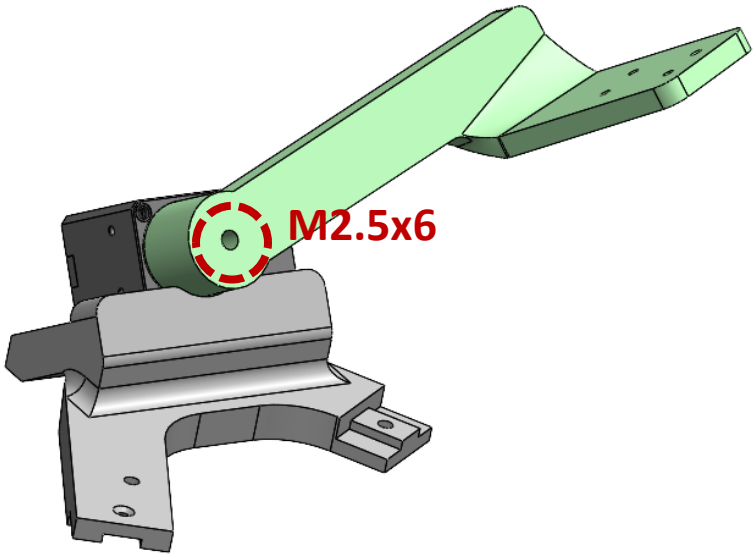
Heat press the 4-40 inserts into the Base part from the direction as shown by the red dotted arrows.

Fasten the Dynamixel XM-430 servo to the base with four of the M2.5x4 wrench bolts (included in the servo kit) at holes indicated by the red dotted circles.

Attach Link1 to the XM-430 servo with the M2.5x6 wrench bolt (included in servo kit) through hole indicated by red dotted circle.



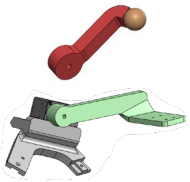




Fingers

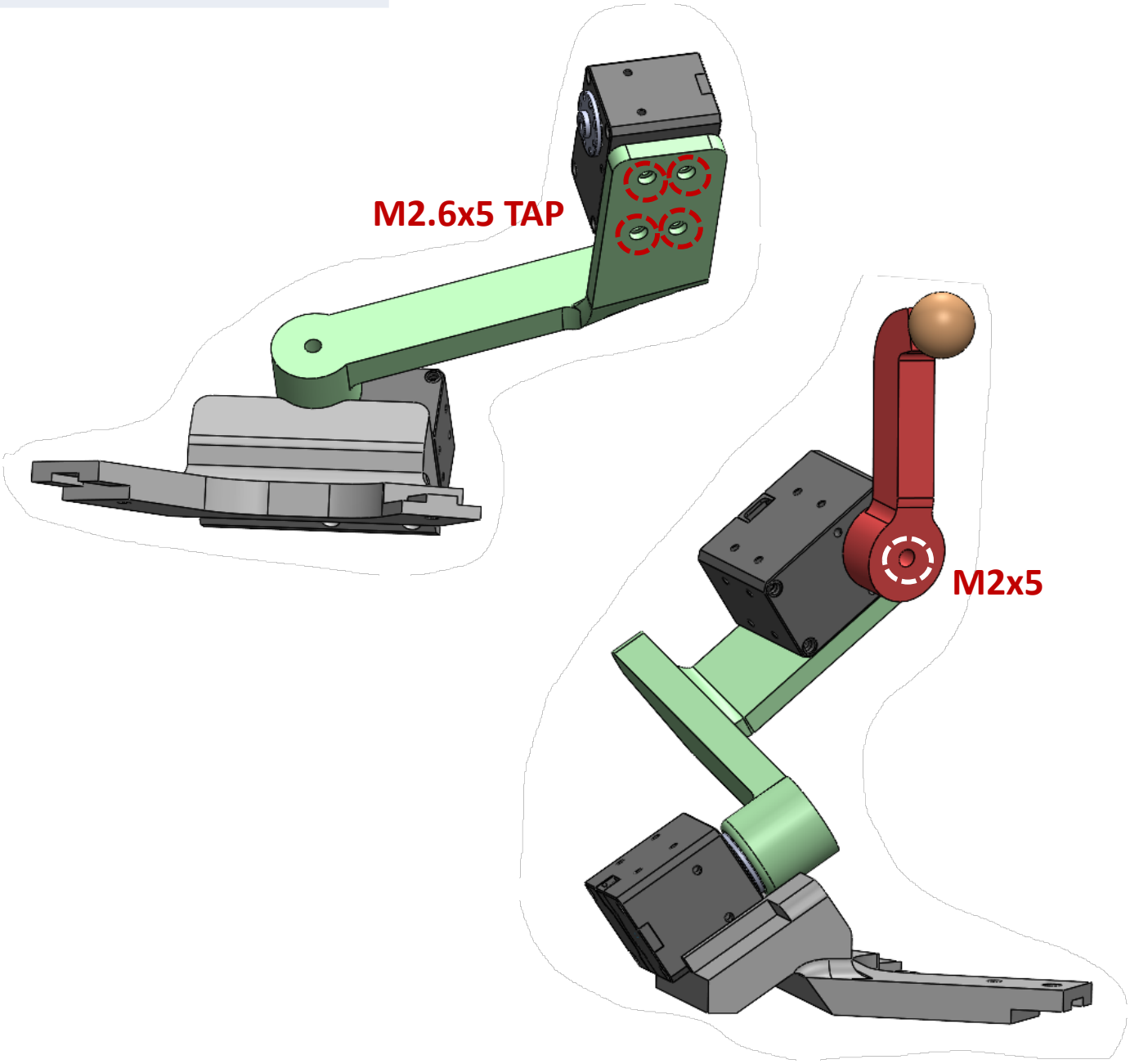
Finger Subassembly (2/2)

Parts
Link2 with cured silicone fingertip (x1)
Link1_xl430 and Base subassembly from previous page (x1)
Base (x1)
Dynamixel XL-430 W250-T



Fasten the Dynamixel XL-430 servo to the Link1 with four of the M2.6x5 TAP bolts (included in servo kit) through holes indicated by red dotted circle.

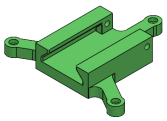
Attach the Link2 (with cured silicone fingertip) to the Dynamixel XL-430 servo an M2x5 bolt (included in servo kit) through hole indicated by white dotted circle.



Final Assembly

Attaching the Subassemblies

Parts
Finger sub assembly from previous pages (x1)
4-40 7/16" long flat head screw (x6)
DovetailToBottom



Connect the 3 finger subassemblies with 4-40 screws through the holes circled in red below. Only the bases are shown in the simplified images below for clarity.

The DovetailToBottom part can be attached in the same way with 4-40 screws through the holes indicated by the white dotted circles. This part allows the hand to be easily mounted to robot arms with a compatible dovetail part (see OpenHand website) but can be swapped or skipped for alternate mounting solutions.