Eyes i2

Download STL files from the Gallery (https://inmoov.fr/inmoov-stl-parts-viewer/?bodyparts=i2Head).

Before printing all the parts you should print the CALIBRATOR (https://inmoov.fr/wp-content/uploads/2019/01/Calibrator.stl), to check if your parts will fit together. If you have a very hard time putting those parts together, adjusting the horizontal expansion setting of your slicer software can solve that, this setting can vary depending of your slicer and printer but users report to set it at -0.15 is a great place to start.

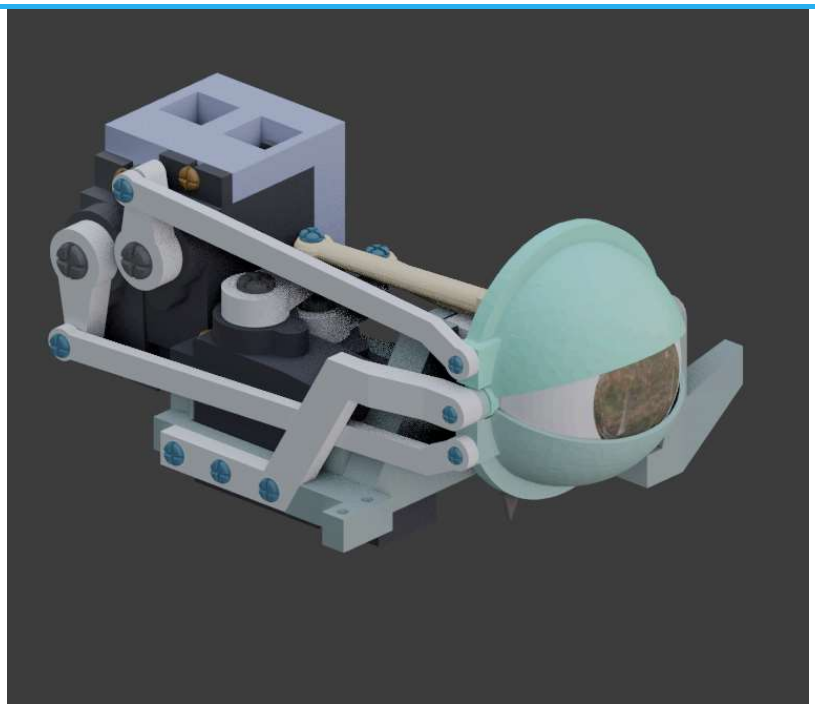
- 4 servos JX PDI 1109MG (avoid using cheap SG90, they won't last long)
- 1 eye transparent cover/protection. See in the old eye tutorial (https://inmoov.fr/eye-mechanism/) how to make your own.
- 1 iris paper print Download File (https://inmoov.fr/wp-content/uploads/2024/03/IrisEyes2.png)
- micro camera(select the type2 with auto focus) https://fr.aliexpress.com/item/1005004200917640.html?spm=a2g0o.order_list.order_list_main.76.40465e5b637U38&gatewayAdapt=glo2fra (https://fr.aliexpress.com/item/1005004200917640.html?spm=a2g0o.order_list.order_list_main.76.40465e5b637U38&gatewayAdapt=glo2fra)
- 3 x Phillips Head 2 x 6mm Self Tapping Countersunk Screws
- 11 x Phillips Head 2 x 6mm Self Tapping Screws
- 8 x Phillips Head 3 x 10mm Self Tapping Screws
- 4 x Phillips Head 1.5 x 7mm Self Tapping Screws

i2Eyes printed parts for 1 Right Eye:

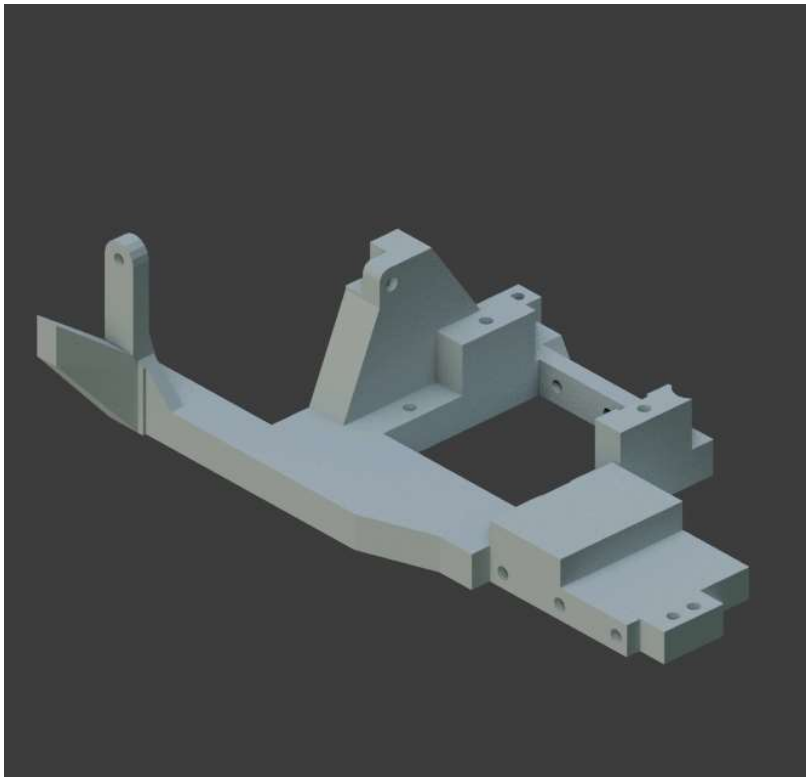
Here is the list of parts and the number of prints needed for the head:

- 1x Eye-R-AllPartsV2.stl (https://inmoov.fr/wp-content/uploads/stl/i2Eyes/Eye-R-AllPartsV2.stl)
- 1x Eye-R-BaseV5.stl (https://inmoov.fr/wp-content/uploads/stl/i2Eyes/Eye-R-BaseV5.stl)

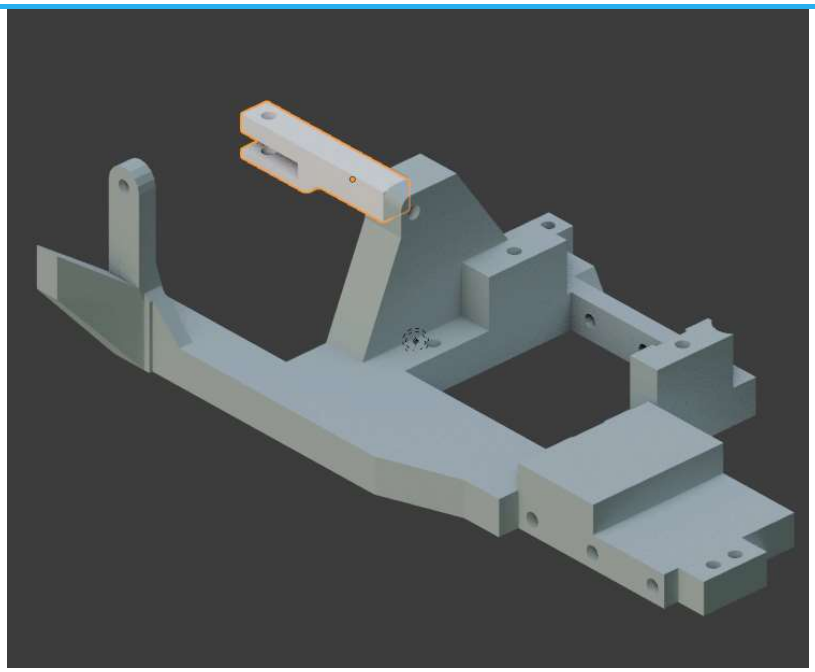
Print with an infill of 30%, wall thickness 2mm, if your printer is well calibrated there is no support required.



(https://inmoov.fr/eyes-i2/i2eye37/#main)

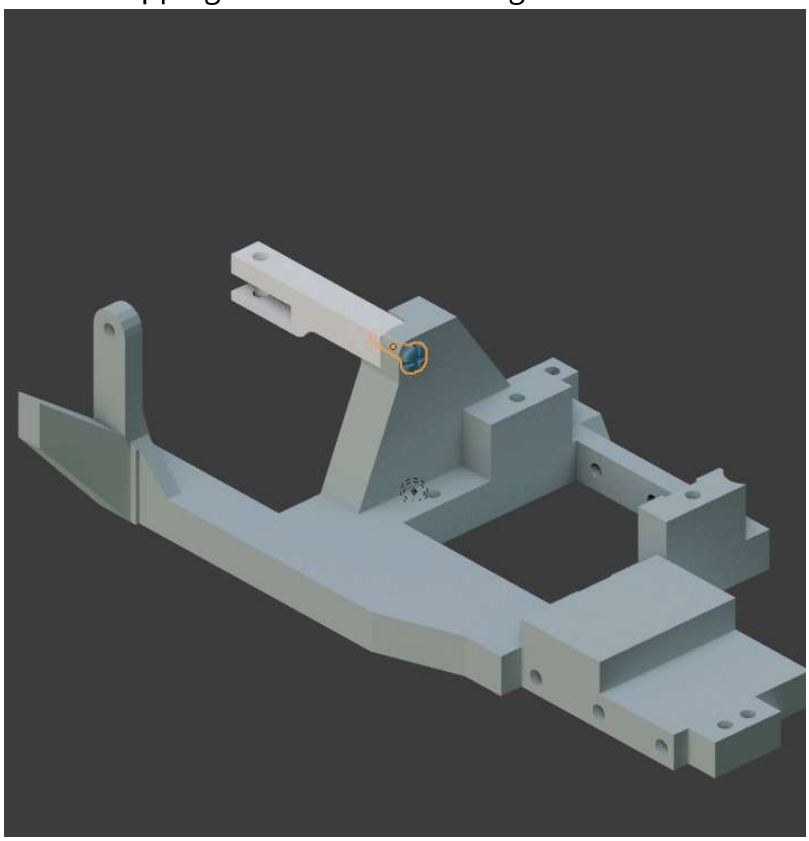


(https://inmoov.fr/eyes-i2/i2eye36/#main)

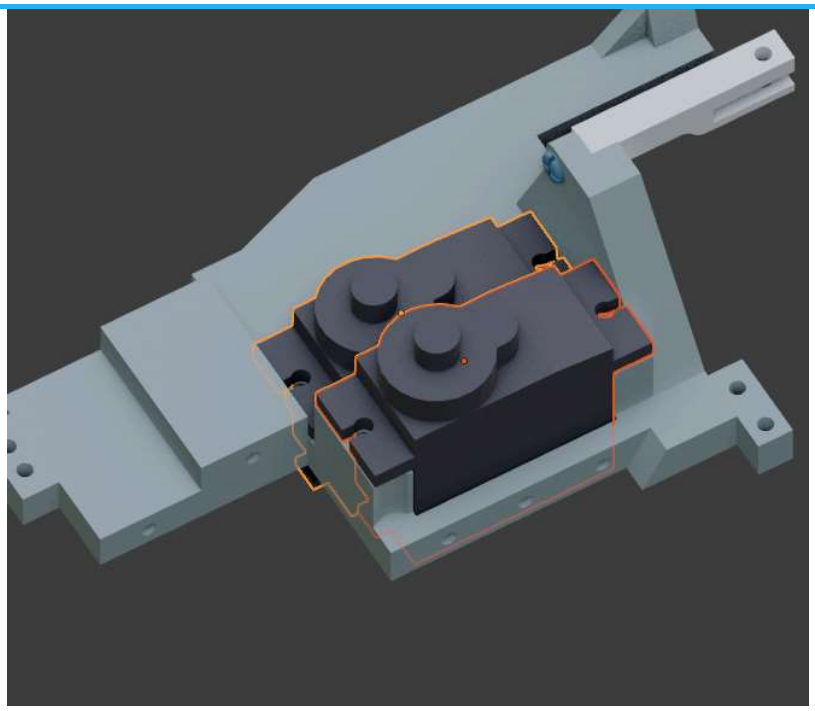


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Glue or use a 2 x 6mm Self Tapping screw to maintain together the main shaft to the base.

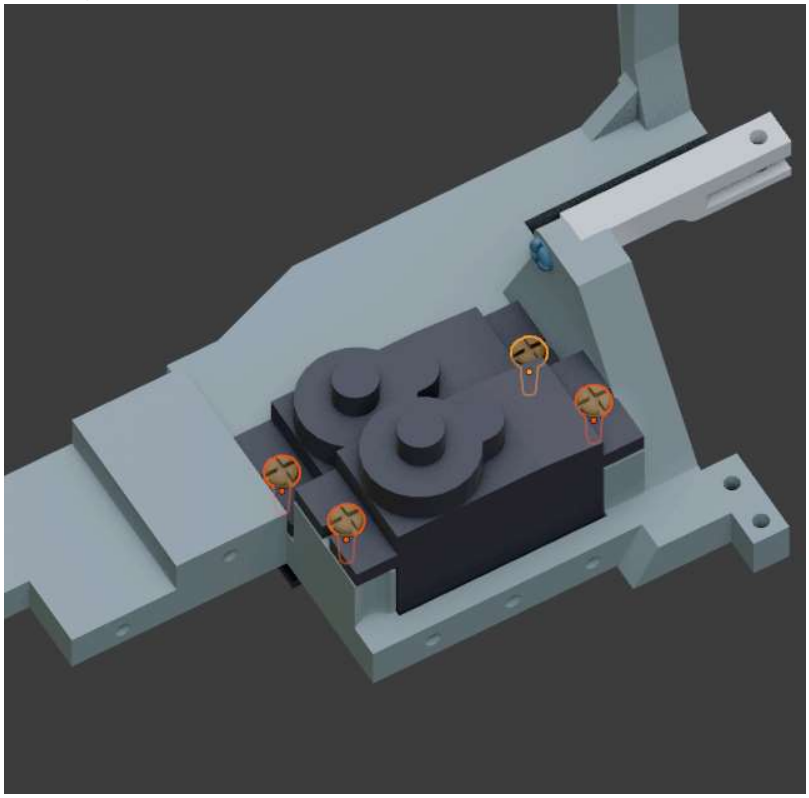


(https://inmoov.fr/eyes-i2/i2eye35/#main)

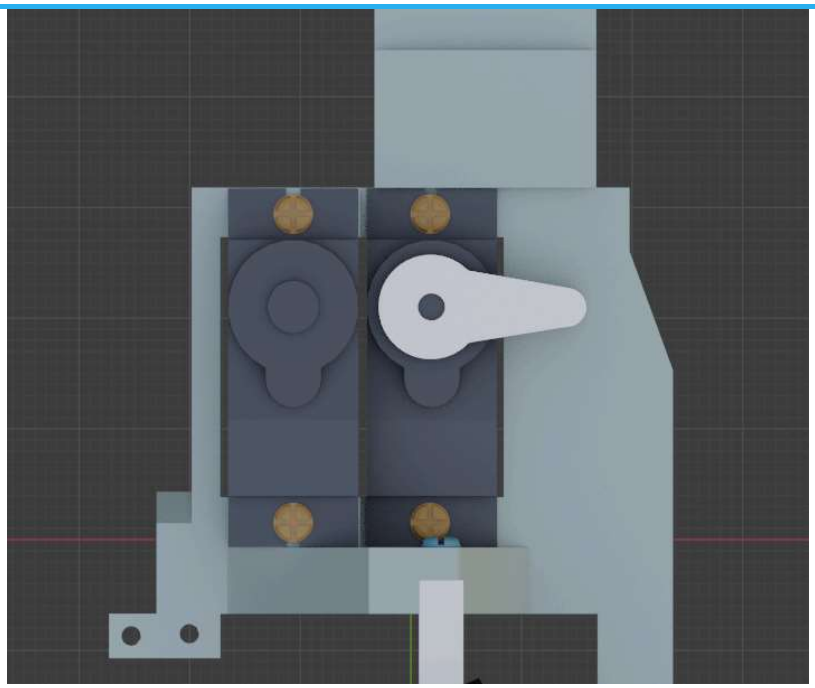


(https://inmoov.fr/eyes-i2/i2eye35/#main)

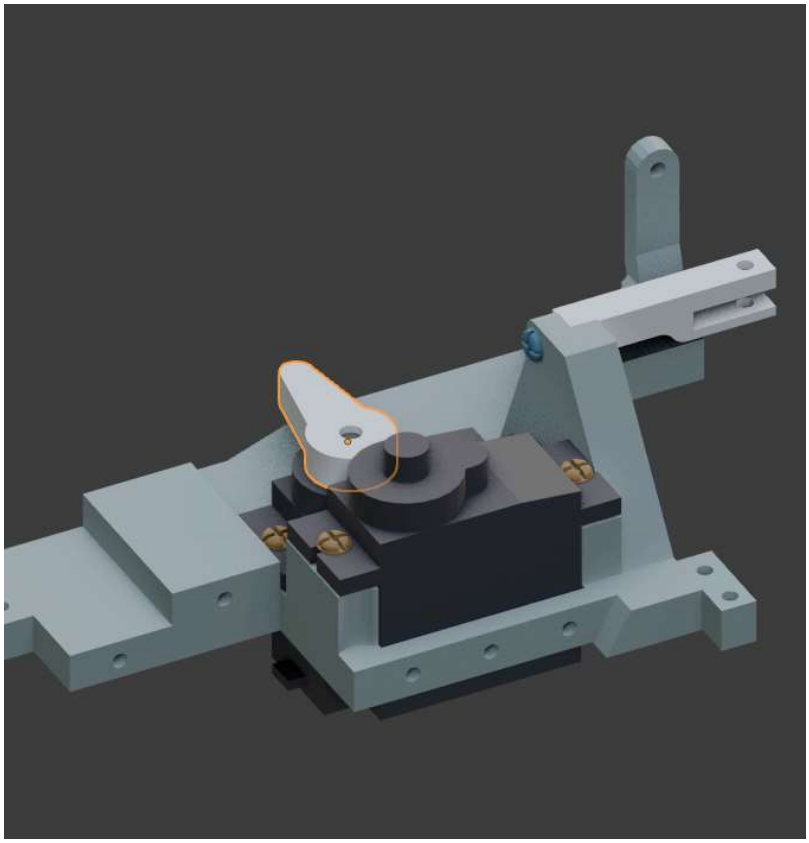
Use 4 screws Self Tapping 3 x 10mm to fix the servos to the base.



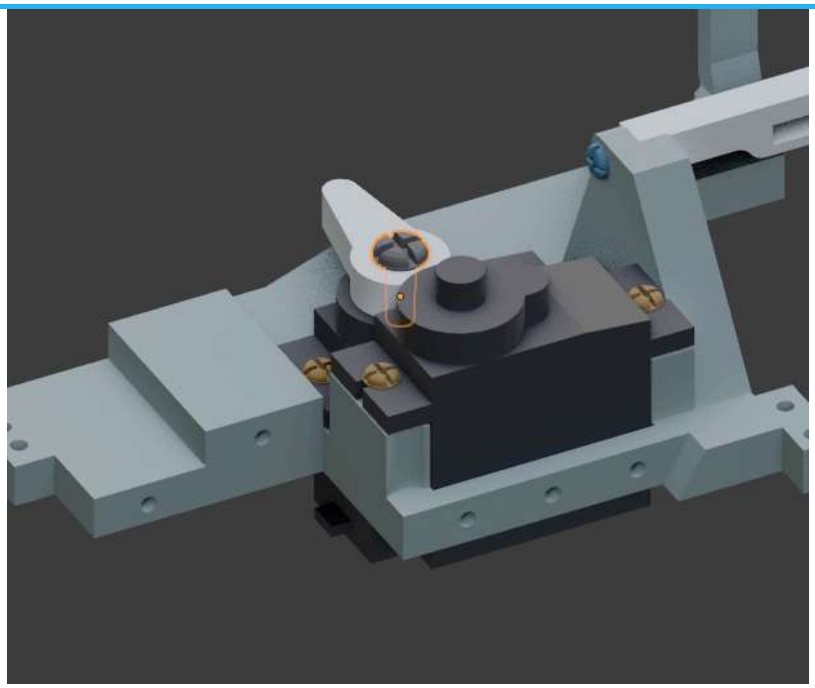
(https://inmoov.fr/eyes-i2/i2eye35/#main)



(https://inmoov.fr/eyes-i2/i2eye35/#main)

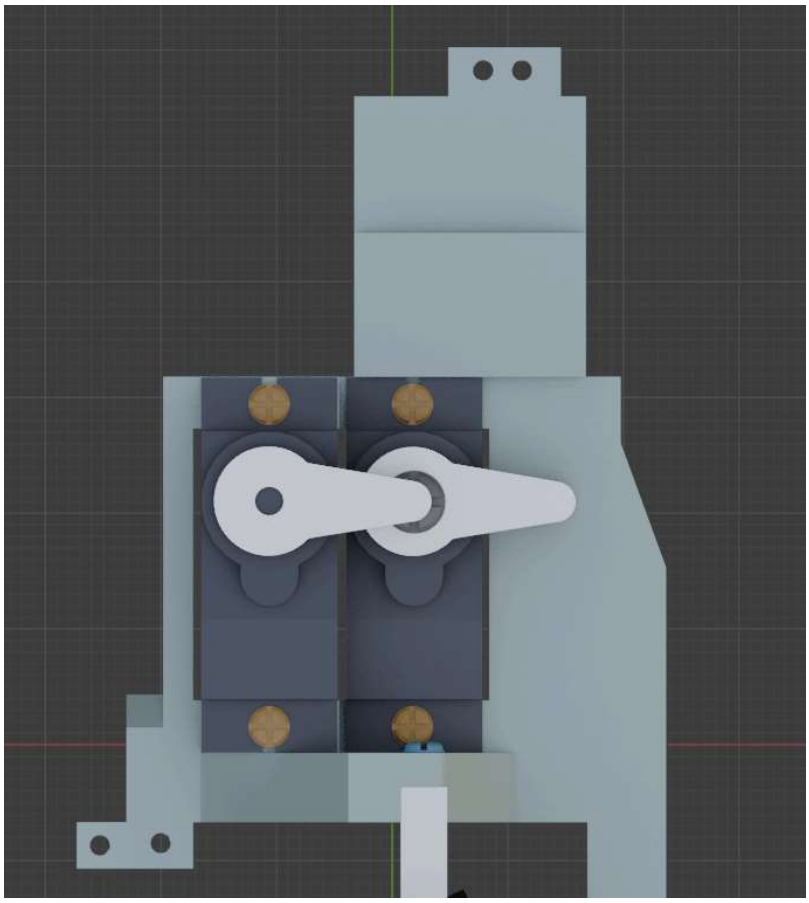


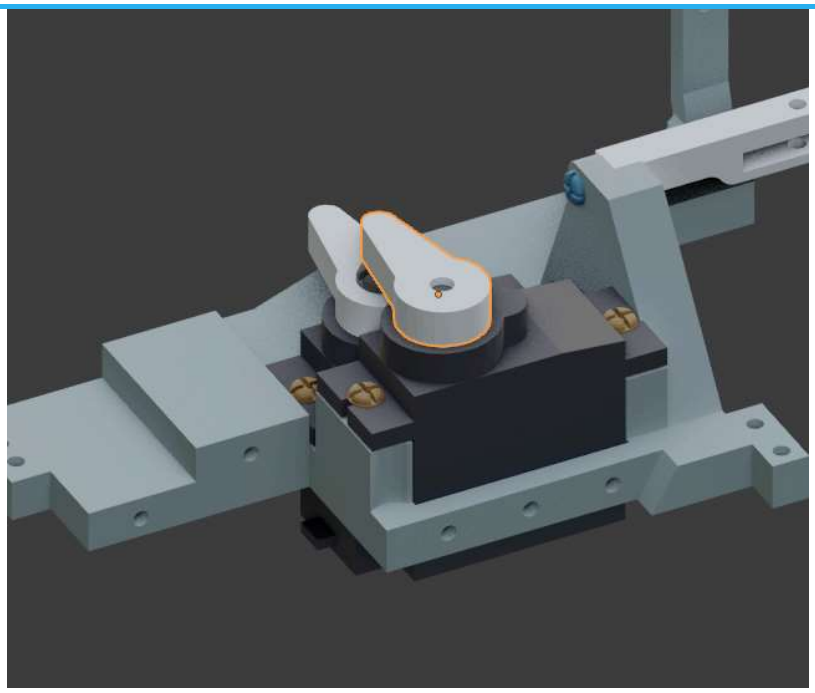
(https://inmoov.fr/eyes-i2/i2eye35/#main)



(https://inmoov.fr/eyes-i2/i2eye35/#main)

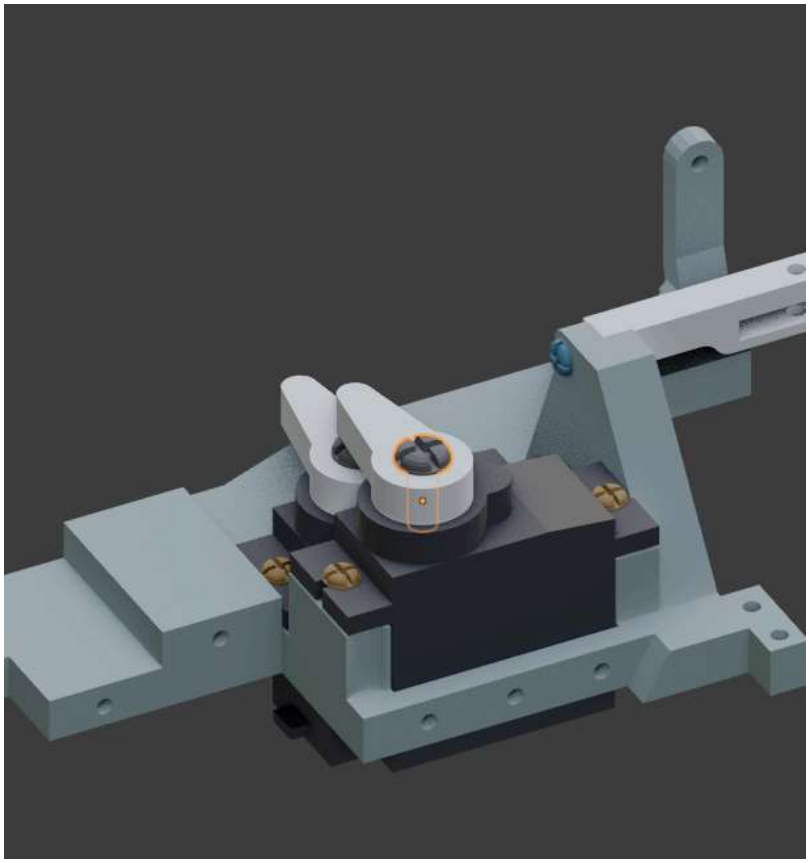
Mount the second horn.





(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use the 3mm screw supplied with the servo to fix the second horn.



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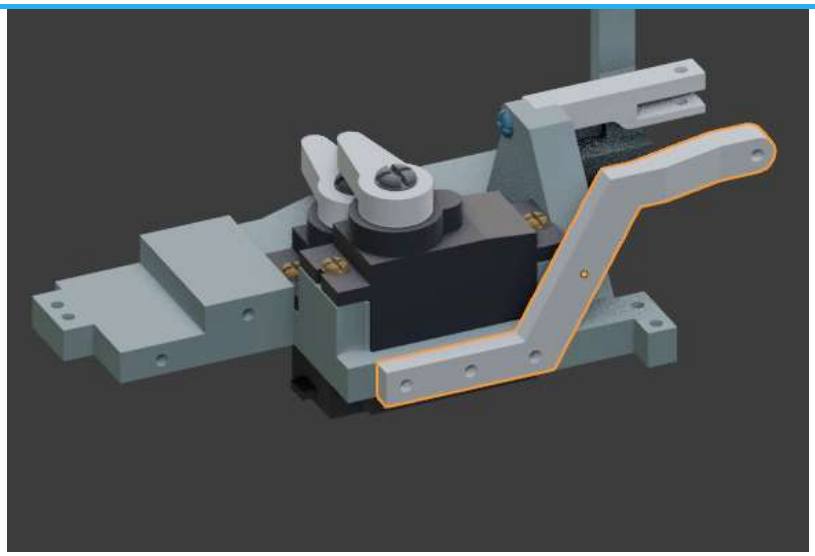
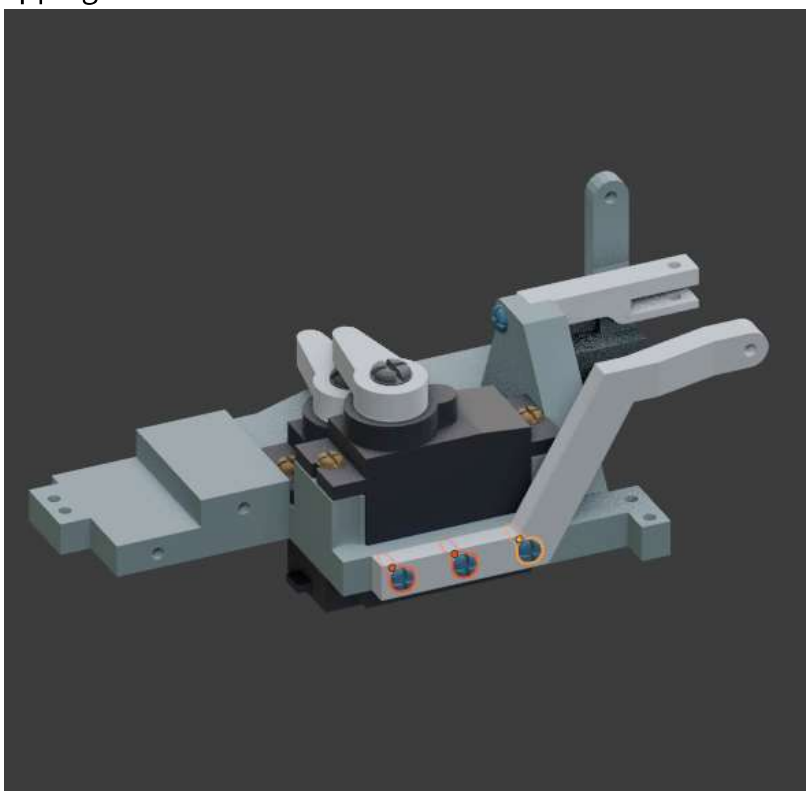
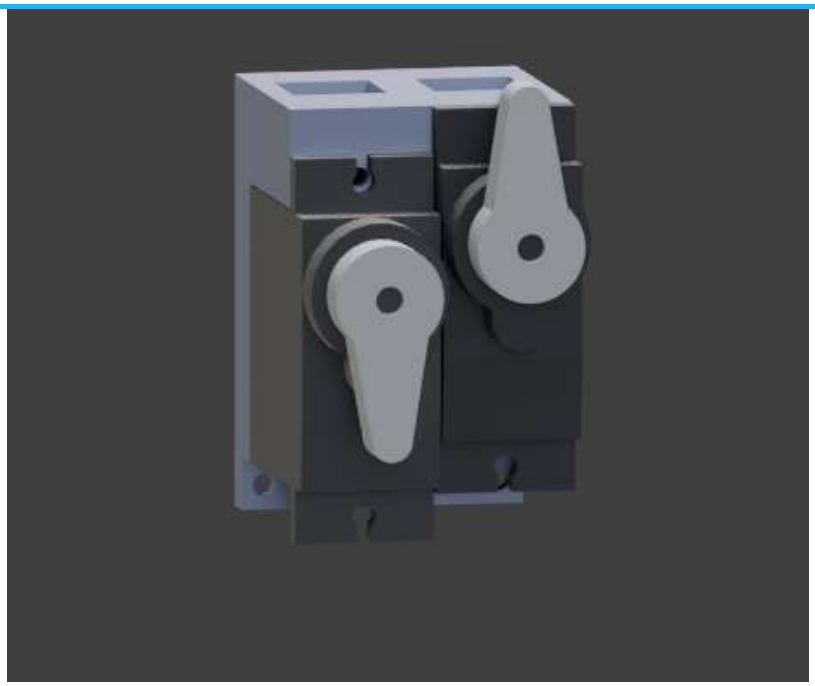


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Glue or use 3 Self Tapping screws 2 x 6mm to fix the side arm to the base.

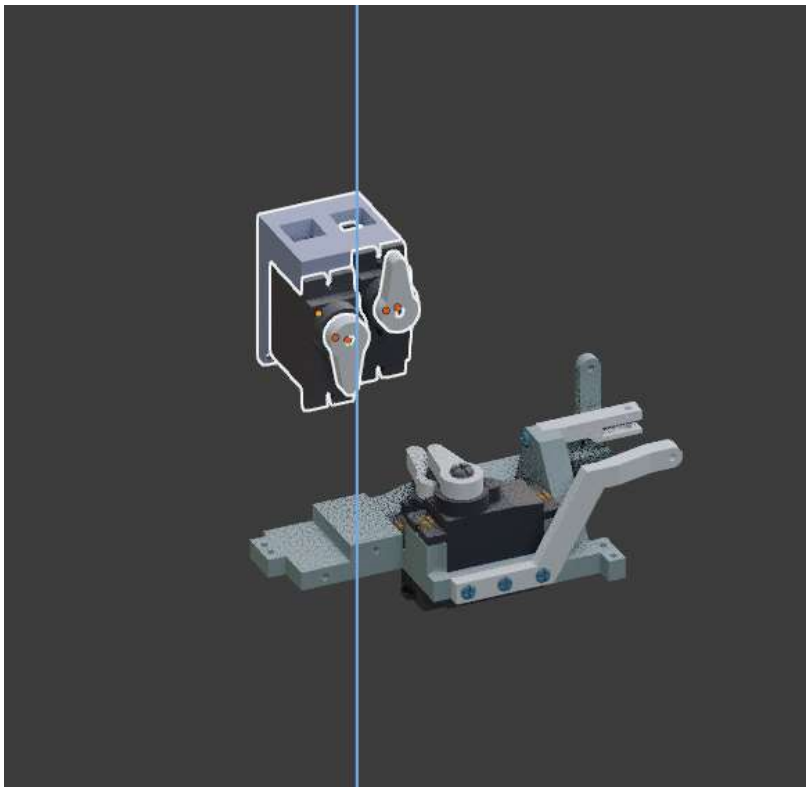


(https://inmoov.fr/eyes-i2/i2eye35/#main)

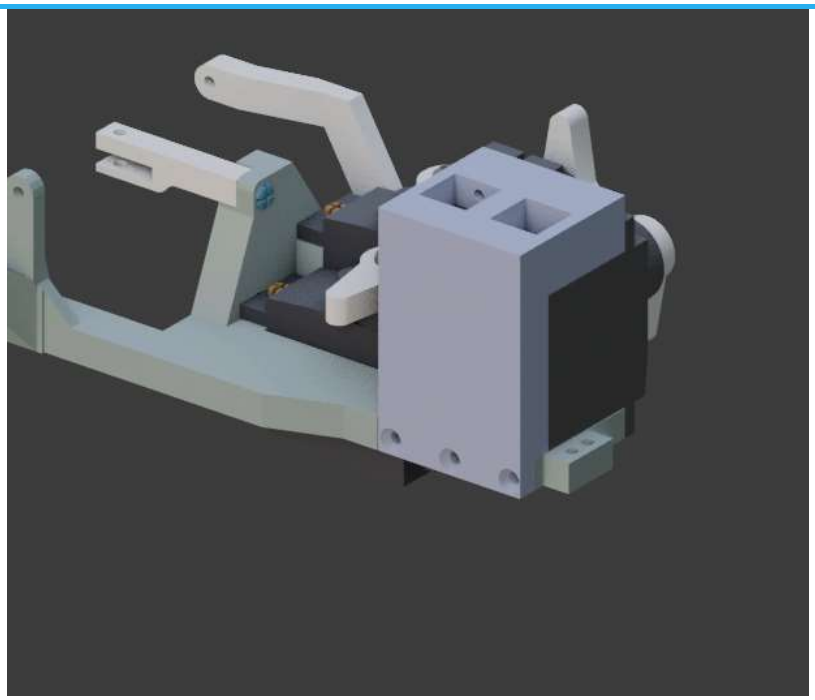


(https://inmoov.fr/eyes-i2/i2Eye24b/#main)

Assemble the side base to the main base.

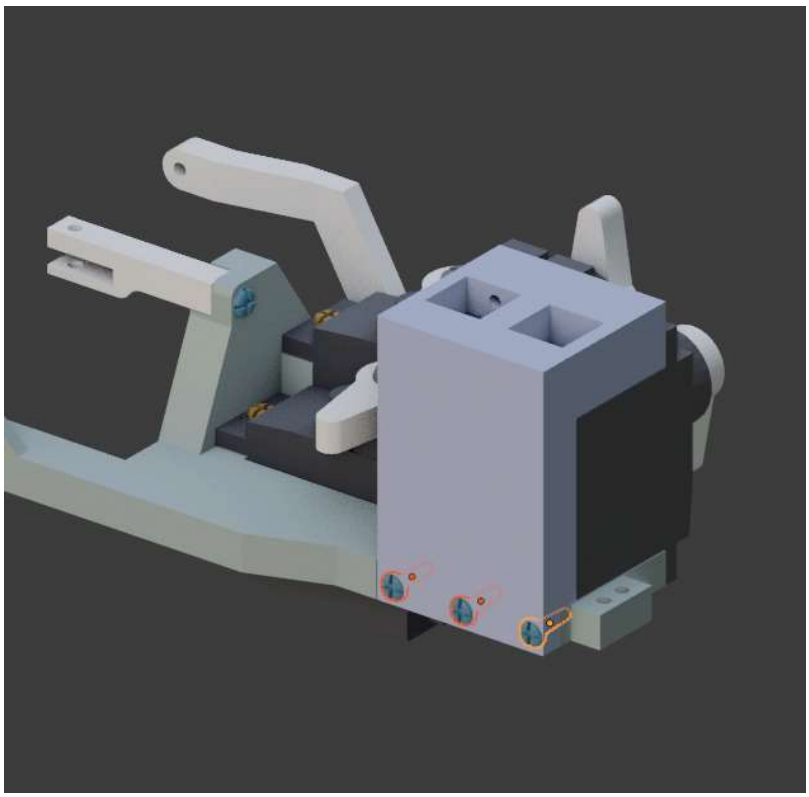


(https://inmoov.fr/eyes-i2/i2eye35/#main)

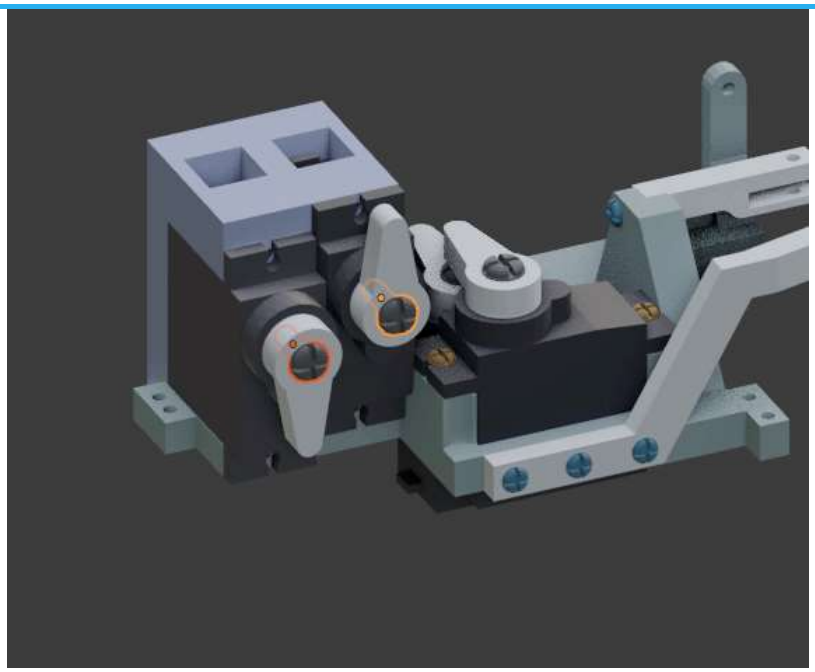


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use a 3 Self Tapping Countersunk Screws 2 x 6mm to maintain together the side base to the main base.Make sure they are fully seated in the countersunk hole, otherwise they might cause you trouble later once mounted in the head.

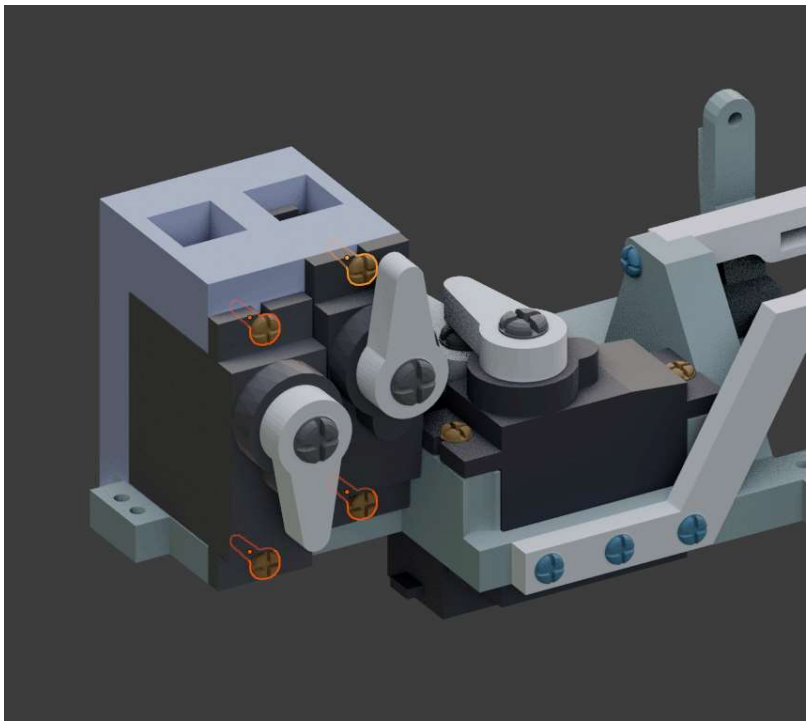


(https://inmoov.fr/eyes-i2/i2eye35/#main)



(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use 4 Self Tapping Screws 3 x 10mm to fix the servos to the side base.



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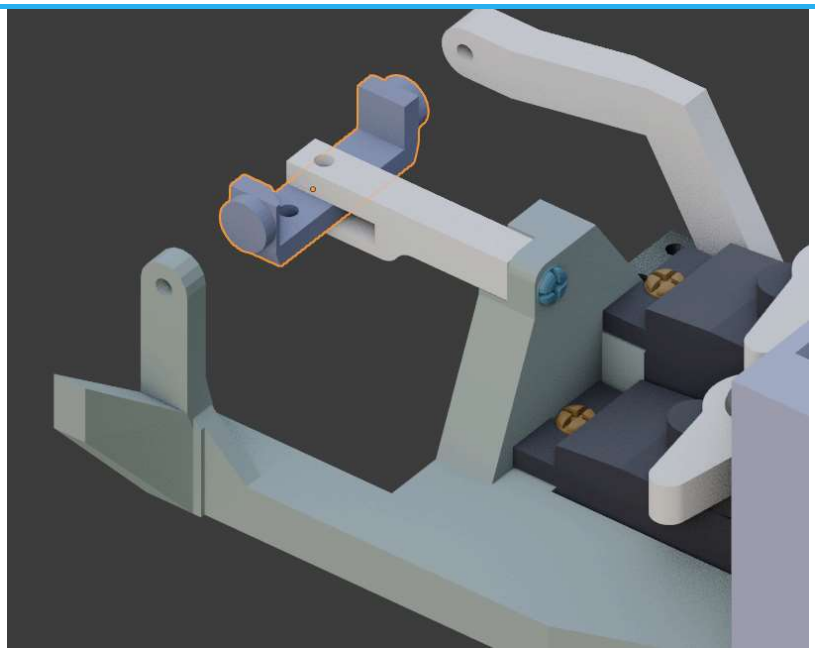
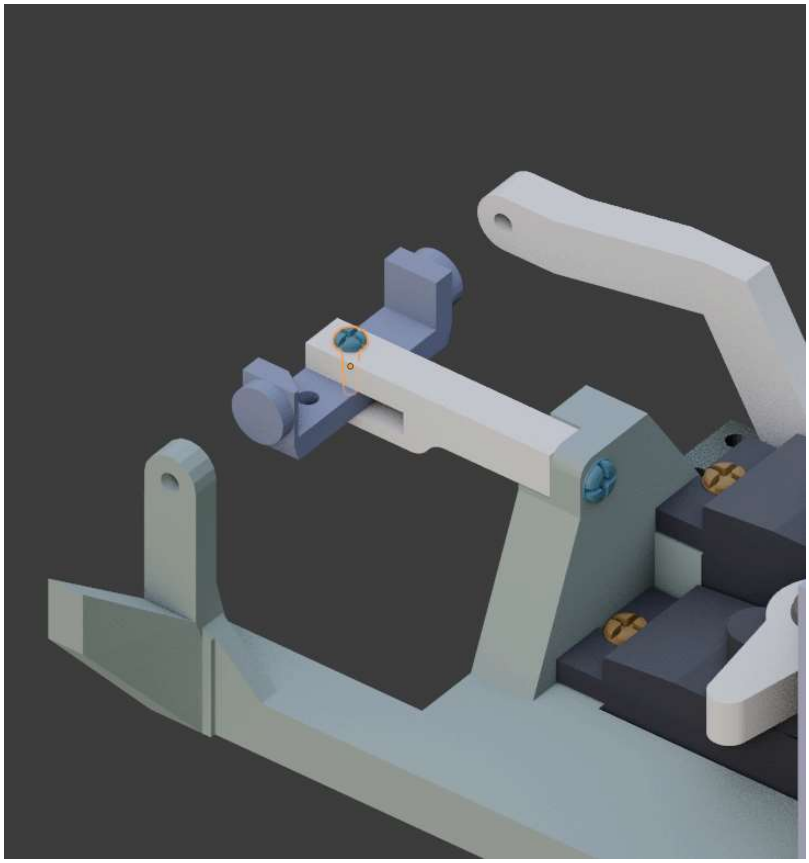
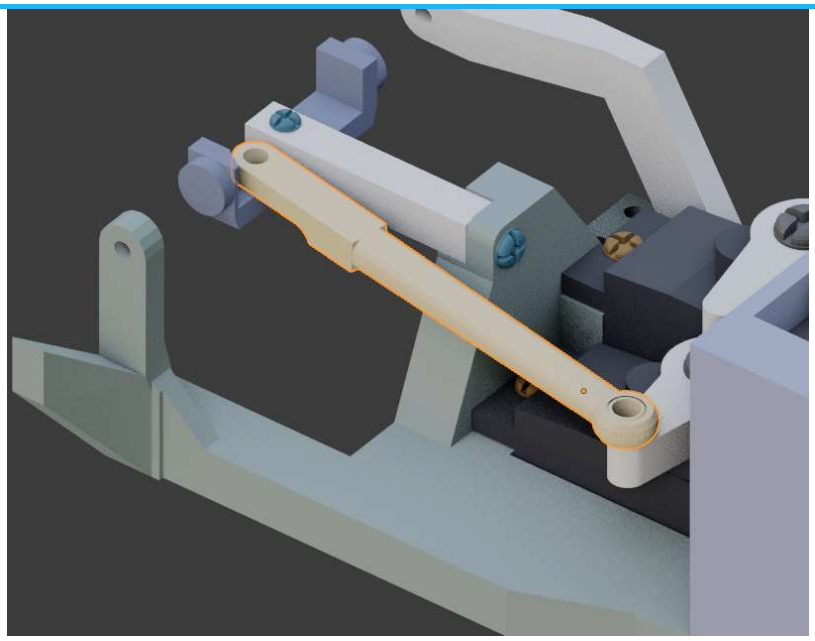


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use a 2 x 6mm Self Tapping screw to maintain the parts together. The hinge should be able rotate freely.

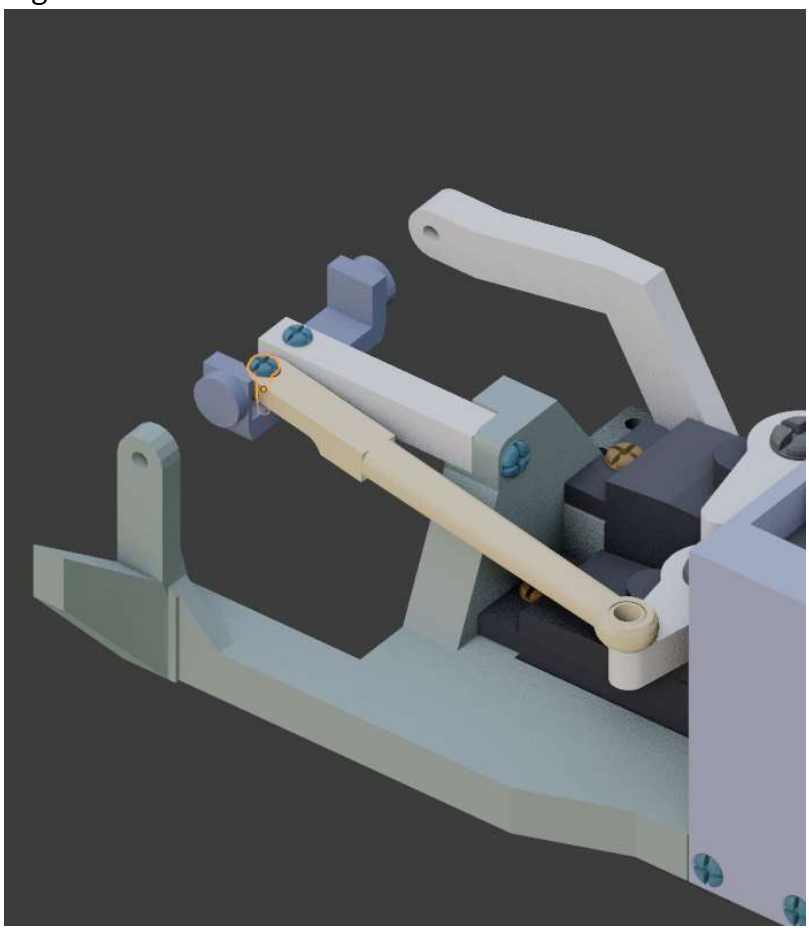


(https://inmoov.fr/eyes-i2/i2eye35/#main)



(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use a 2 x 6mm Self Tapping screw. Do not over tight the screw, movement of the shaft should be able to rotate the hinge.

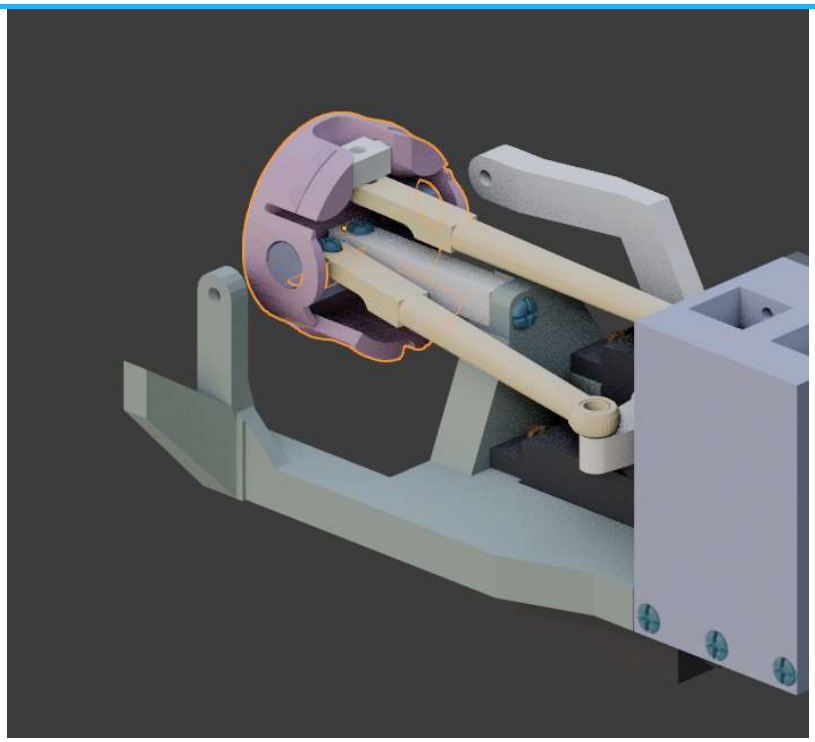


(https://inmoov.fr/eyes-i2/i2eye35/#main)

(https://inmoov.fr/eyes-i2/i2eye35/#main)

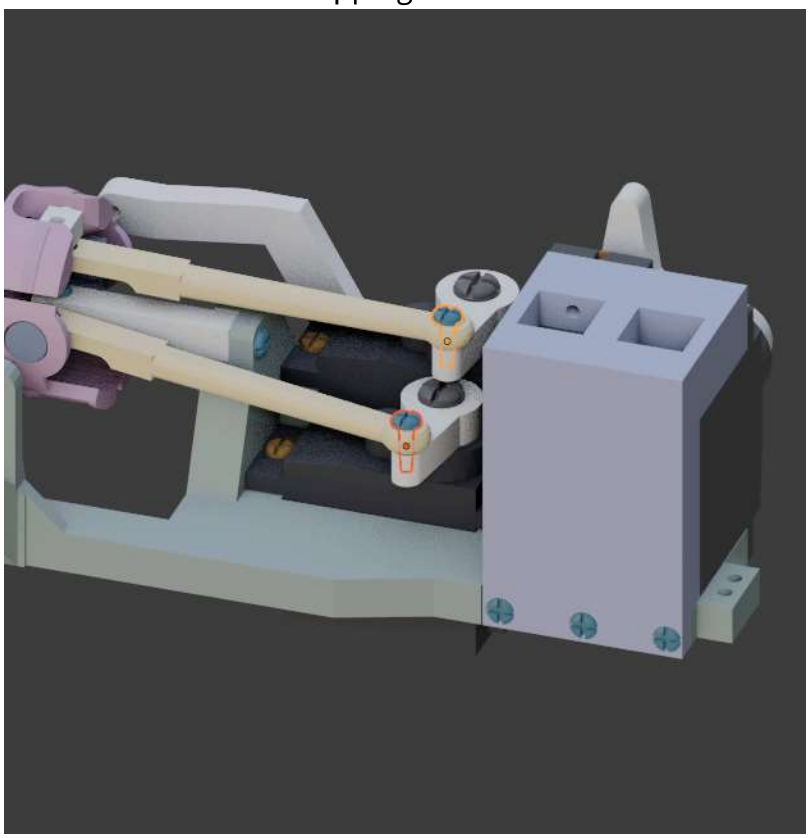
This is the position how we are going to set the shaft with the tiny hinge.

(https://inmoov.fr/eyes-i2/i2eye35/#main)

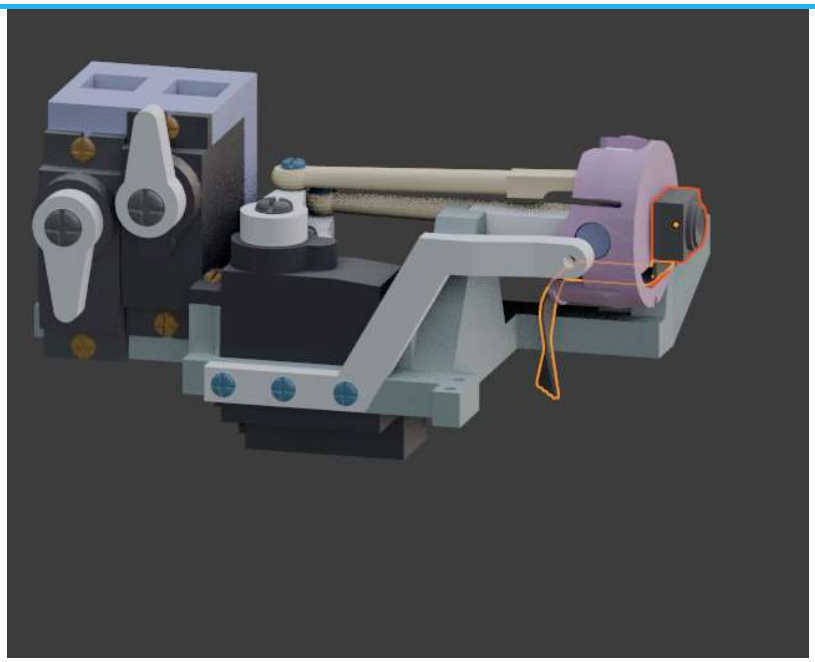


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Now fix the two shafts with 2 x 6mm Self Tapping Screws .

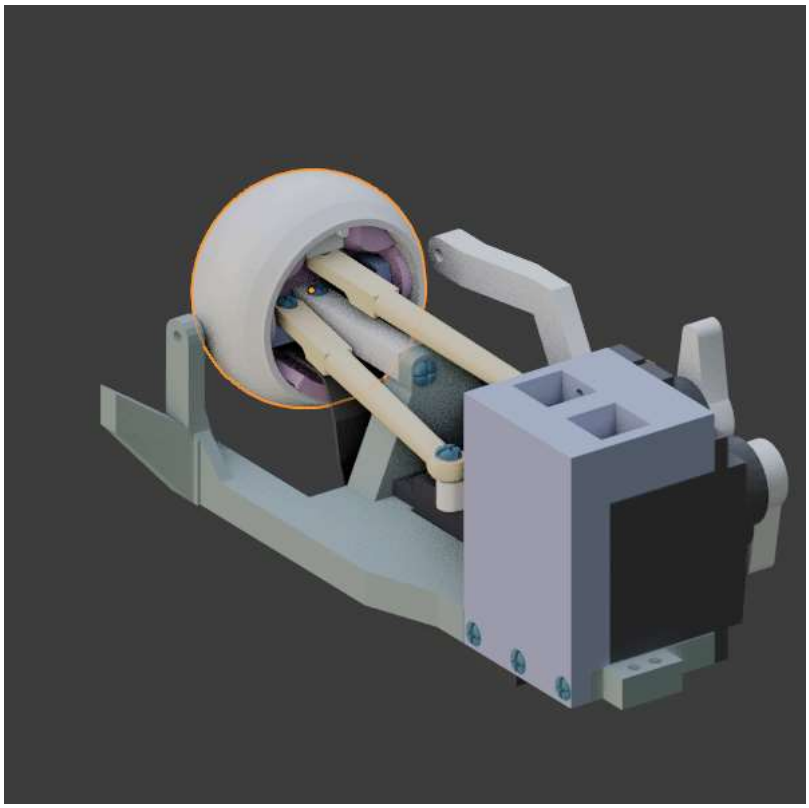


(https://inmoov.fr/eyes-i2/i2eye35/#main)

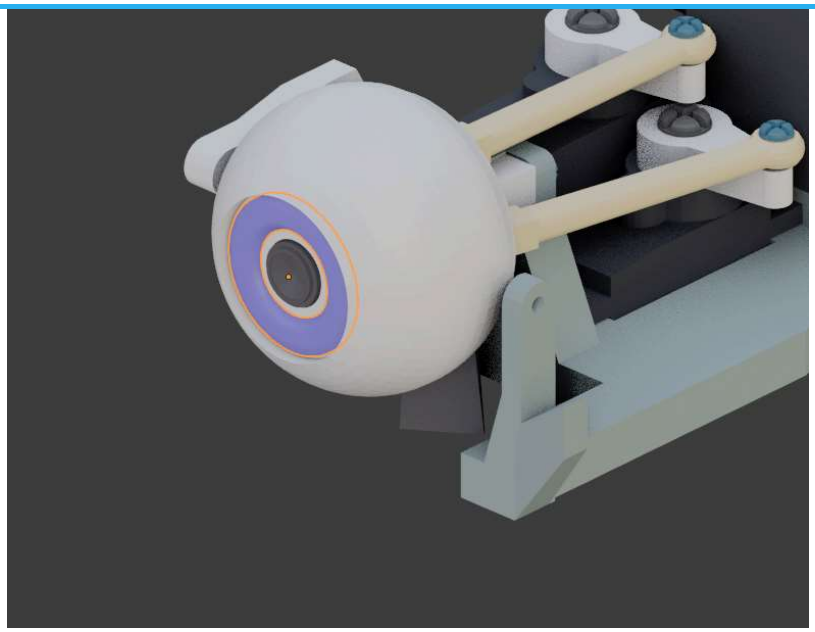


(https://inmoov.fr/eyes-i2/i2eye35/#main)

You can press the camera into the eye ball prior clipping the eye ball on the eye socket if it is easier for you.



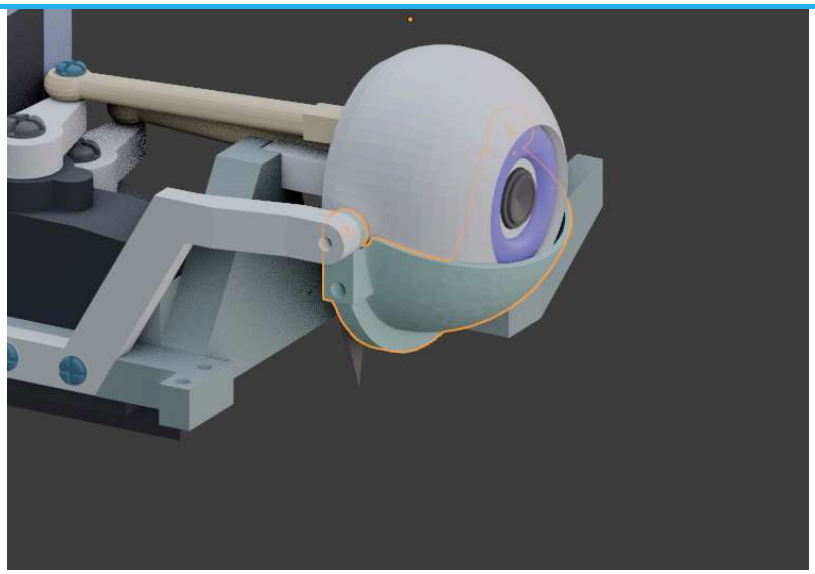
(https://inmoov.fr/eyes-i2/i2eye35/#main)



(https://inmoov.fr/eyes-i2/i2eye35/#main)

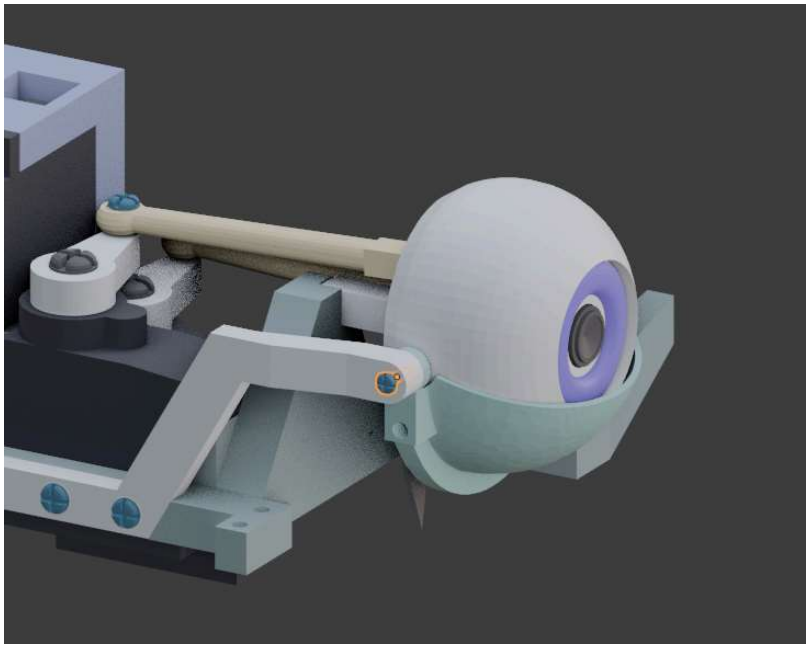
Add and glue carefully the transparent eye protection if you have made one.You can see in the old eye tutorial (https://inmoov.fr/eye-mechanism/) how to create your own.

(https://inmoov.fr/eyes-i2/i2eye35/#main)

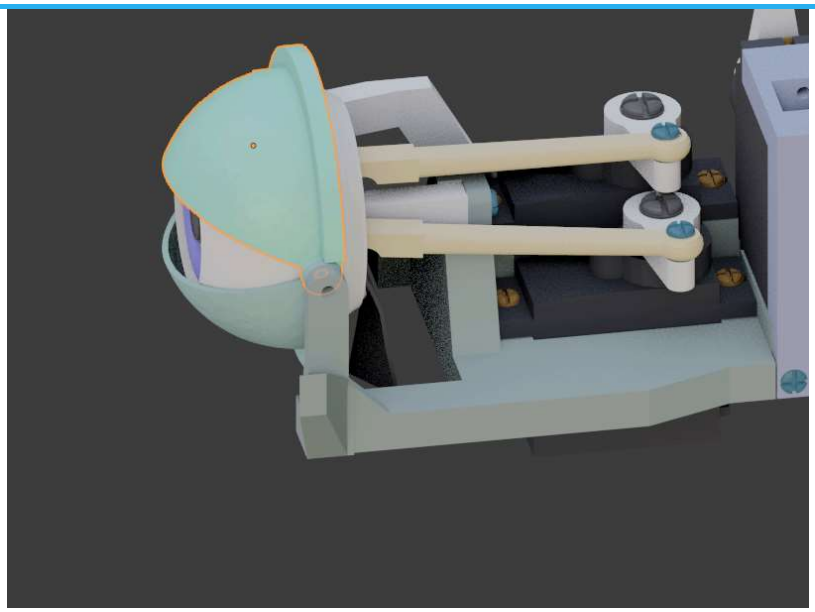


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use a 1.5 x 7mm Self Tapping Screws. Make sure your screw is not too long and too tight, it would avoid the eyeball to rotate freely.

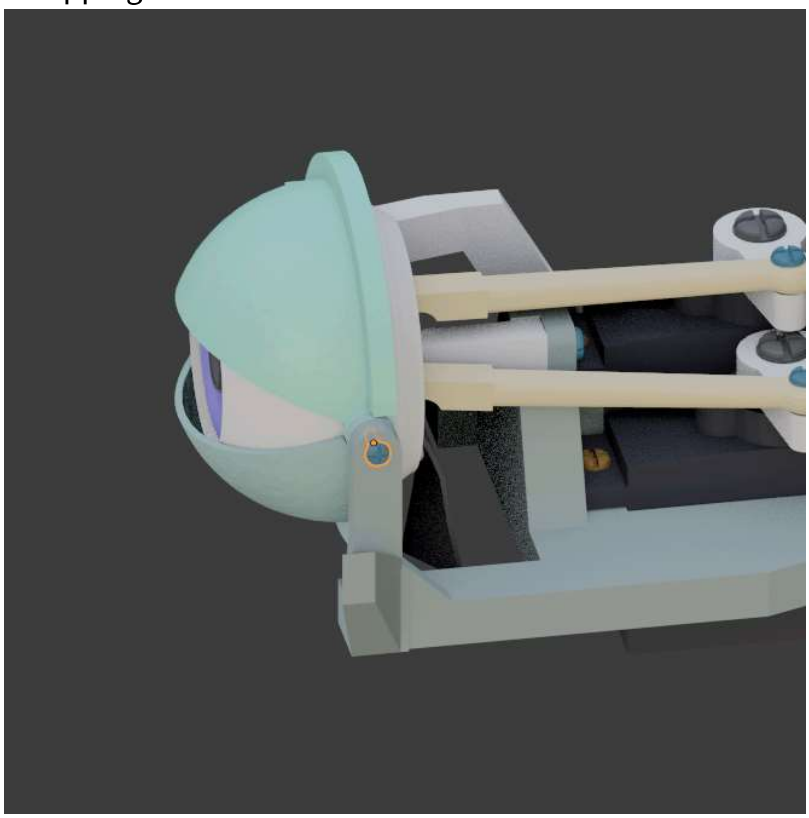


(https://inmoov.fr/eyes-i2/i2eye35/#main)

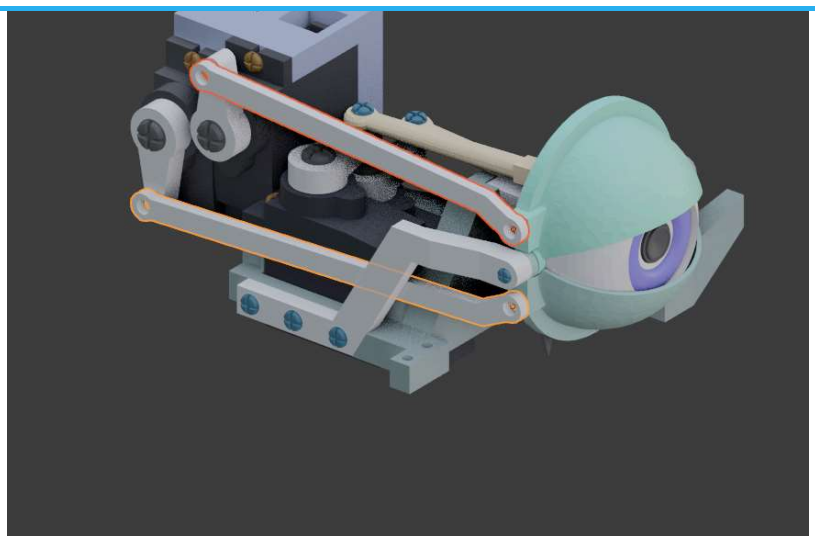


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use a 1.5 x 7mm Self Tapping Screws.

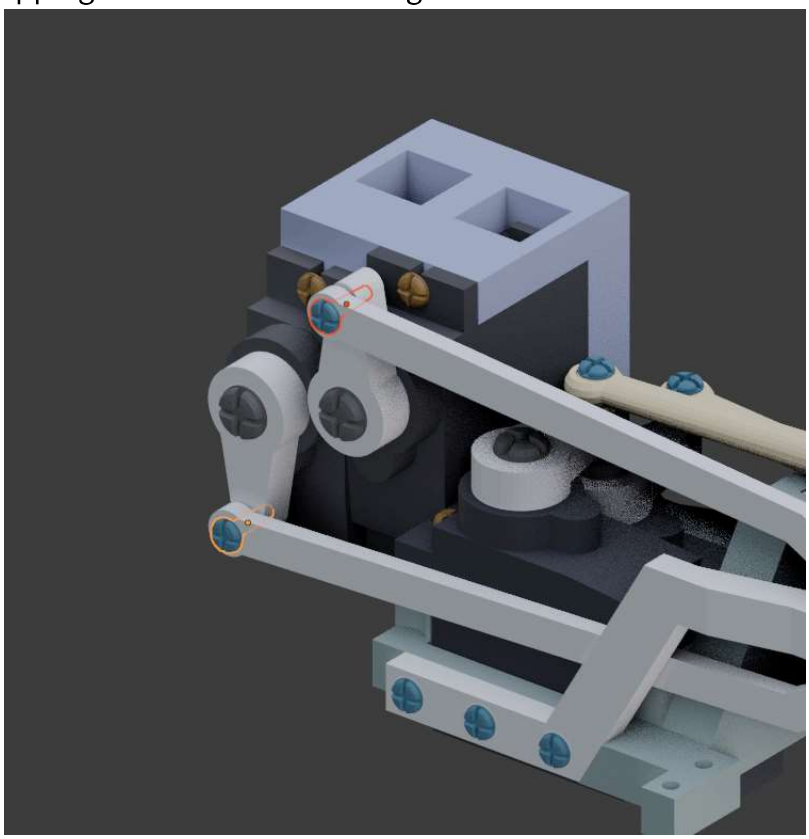


(https://inmoov.fr/eyes-i2/i2eye35/#main)

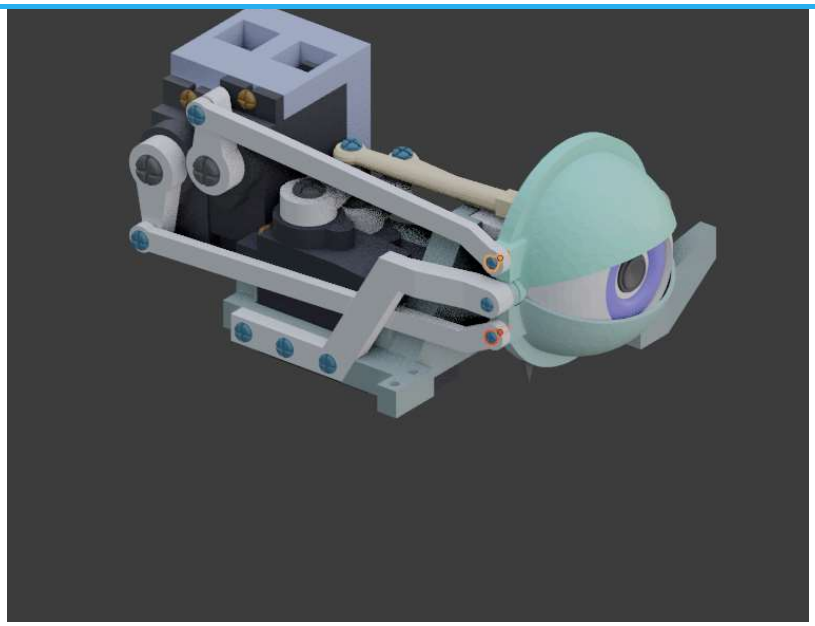


(https://inmoov.fr/eyes-i2/i2eye35/#main)

Use 2 x 6mm Self Tapping Screws. Do not over tight.

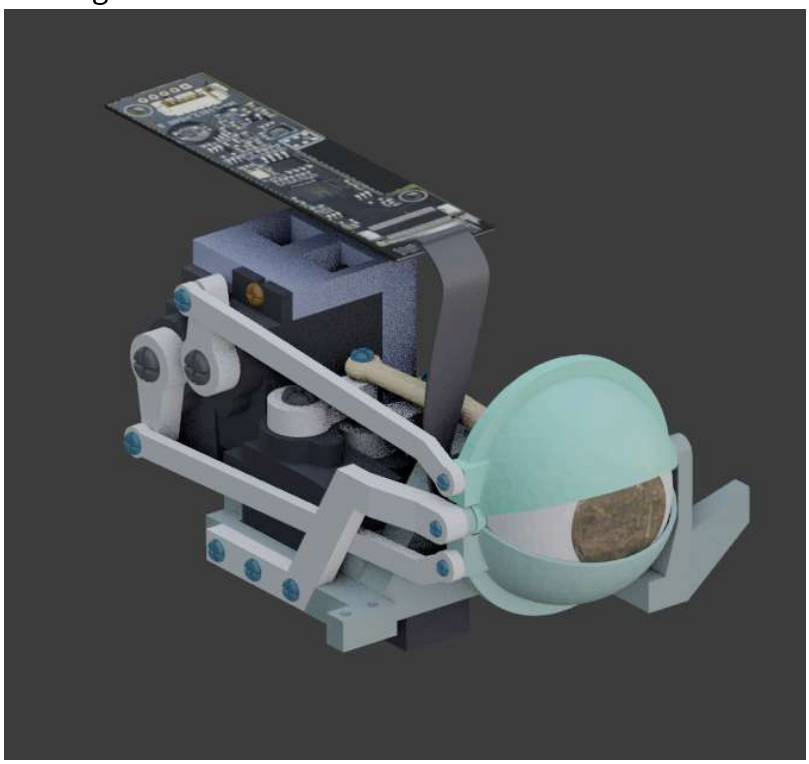


(https://inmoov.fr/eyes-i2/i2eye35/#main)



(https://inmoov.fr/eyes-i2/i2eye35/#main)

Connect the camera driver board and you are done with the right eye!!! You can now proceed to build the left eye following the same order.



(https://inmoov.fr/eyes-i2/i2eye35/#main)

The i2Eyes are synchronized with the original eyes in Myrobotlab. This ensures that if the robot looks up, both eyes look up, same for looking down, right side or left side.

```
autoDisable: true
clip: true
controller: i01.left
enabled: false
idleTimeout: 3000
inverted: false
listeners: [
  ]
maxIn: 180.0
maxOut: 117.0
minIn: 0.0
minOut: 63.0
peers: null
pin: '34'
rest: 91.0
speed: null
sweepMax: null
sweepMin: null
synced:
- i01.head.eyeLeftLR
- i01.head.eyeRightLR
type: Servo
```

(https://inmoov.fr/screenshot-2025-01-05-171513/)

Do the same with data/config/yourConfig/i01.head.eyeY.yml:

```
enabled: false
idleTimeout: 3000
inverted: true
listeners: [
  ]
maxIn: 180.0
maxOut: 97.0
minIn: 0.0
minOut: 67.0
peers: null
pin: '32'
rest: 84.0
speed: null
sweepMax: null
sweepMin: null
synced:
- i01.head.eyeLeftUD
- i01.head.eyeRightUD
type: Servo
```

(https://inmoov.fr/screenshot-2025-01-05-171437/)

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The Author

Previous Reading

i2Head for InMoov (https://inmoov.fr/i2head-for-inmoov/)

I have been working on the design and motorization of a new head. This new head is compatible with the three piston neck and the rest of the InMoov body. It has a silicon skin made in some 3D printable molds and can do face expressions. Here is the female version: […]

Comments 4

Andrew Corson (https://inmoov.fr/members/afcorson/) *January 4, 2025 at 11:58 pm* (https://inmoov.fr/eyes-i2/#comment-17521)

I have just finsihed printing and assembling the new i2 head.
It all works well except for the eyes. Mine will never move in sync because they have independent servos, unlike version one. Human eyes move horizontally and vertically in sync. So should the robot. I am inclined to redesign the eye movement so that it is similar to version one with one serrvo moving the eyes vertically and another horizontally. I think this will be a challenge though.

You need to synchronize them by software in Myrobotlab.
Make sure the original eyes of the head are started because the i2Head eyes servos are synchronized on them.

I use Synthiam ARC for my InMoov robot and script language for the programming.
Unfortunately no amount of programming will compensate for the many pivot points which eventually work their way loose.
After moving left or right, the eyes never return to the same central position due to inherent inconsistent movement.
I will keep persisting and try to come up with a solution.

Gael Langevin (https://inmoov.fr/members/admin/) *January 8, 2025 at 7:26 pm* (https://inmoov.fr/eyes-i2/#comment-17532)

Well, in Myrobotlab we don't have that issue, it works pretty well and synchronized. I am using the eyes mechanism almost everyday since last month of May and they stay rather reliable. Are you using a PCA9685 connected to an arduino or something else?

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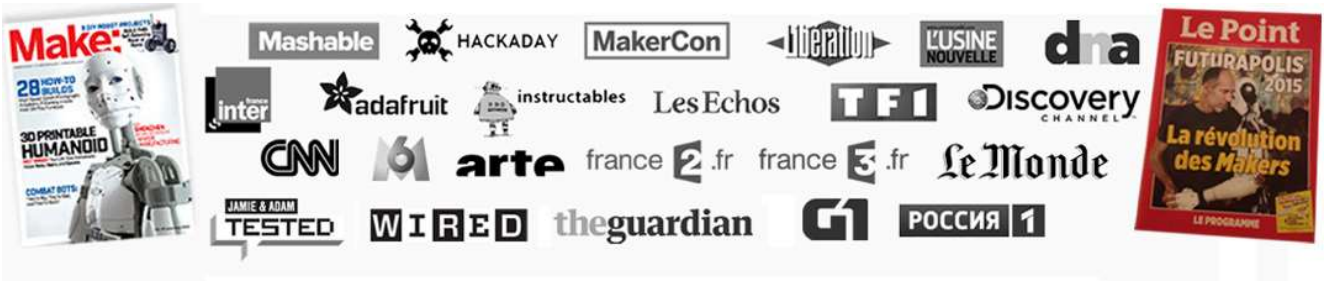

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