3D Printed Camera Mounting Part

Created by Renwei Hu, last modified yesterday at 10:05 PM

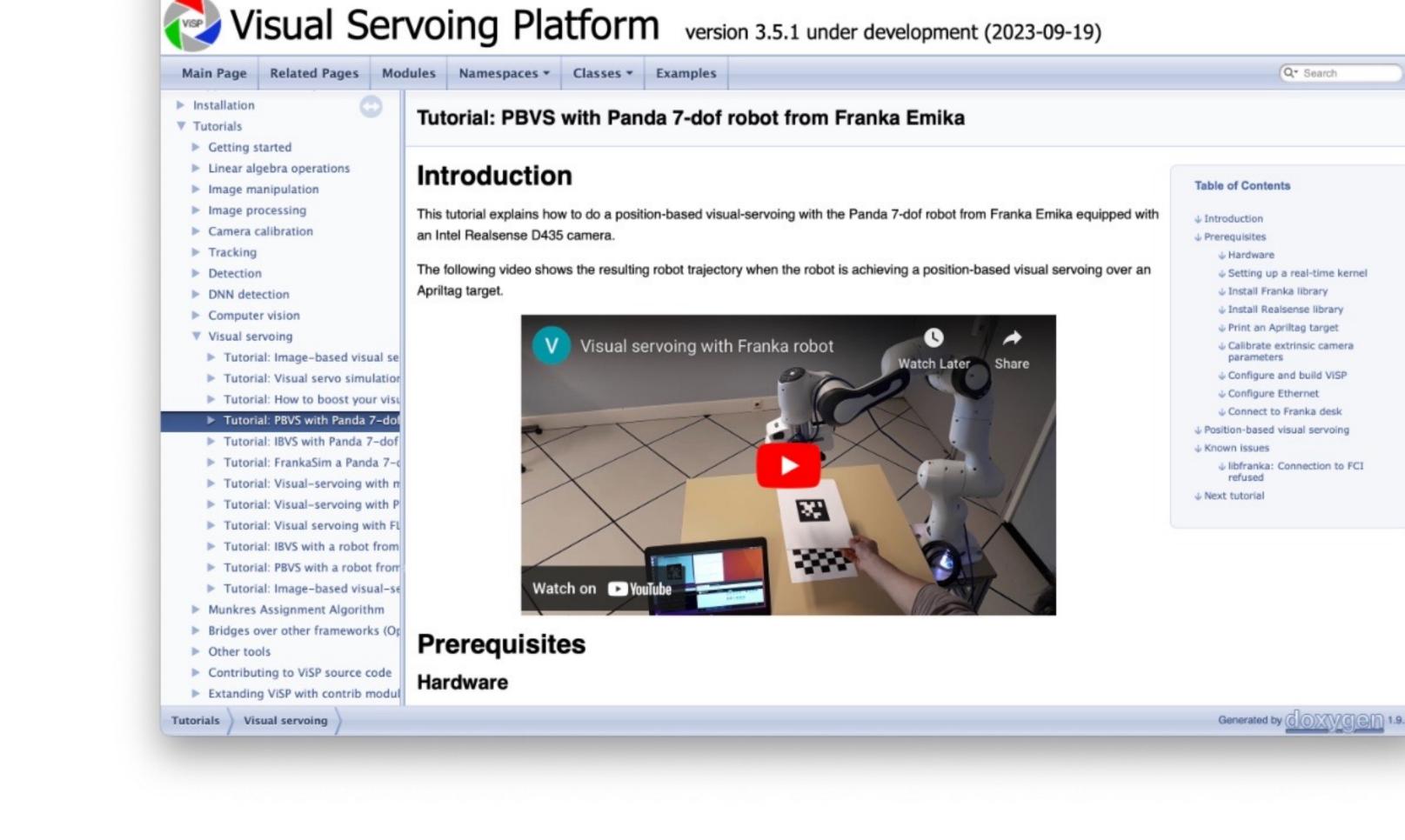
Background

As mentioned on the page Depth Camera Mounting Analysis, a custom 3D-printed model needs to be designed and built to mount the depth camera on the end-effector of the robotic arm.

Progress

Updated on 📋 18 Sep 2023

After discussing with our client and searching for existing resources online, we found there was another team working with computer vision solutions using both Franka Emika robotic arm and Intel Realsense depth camera.

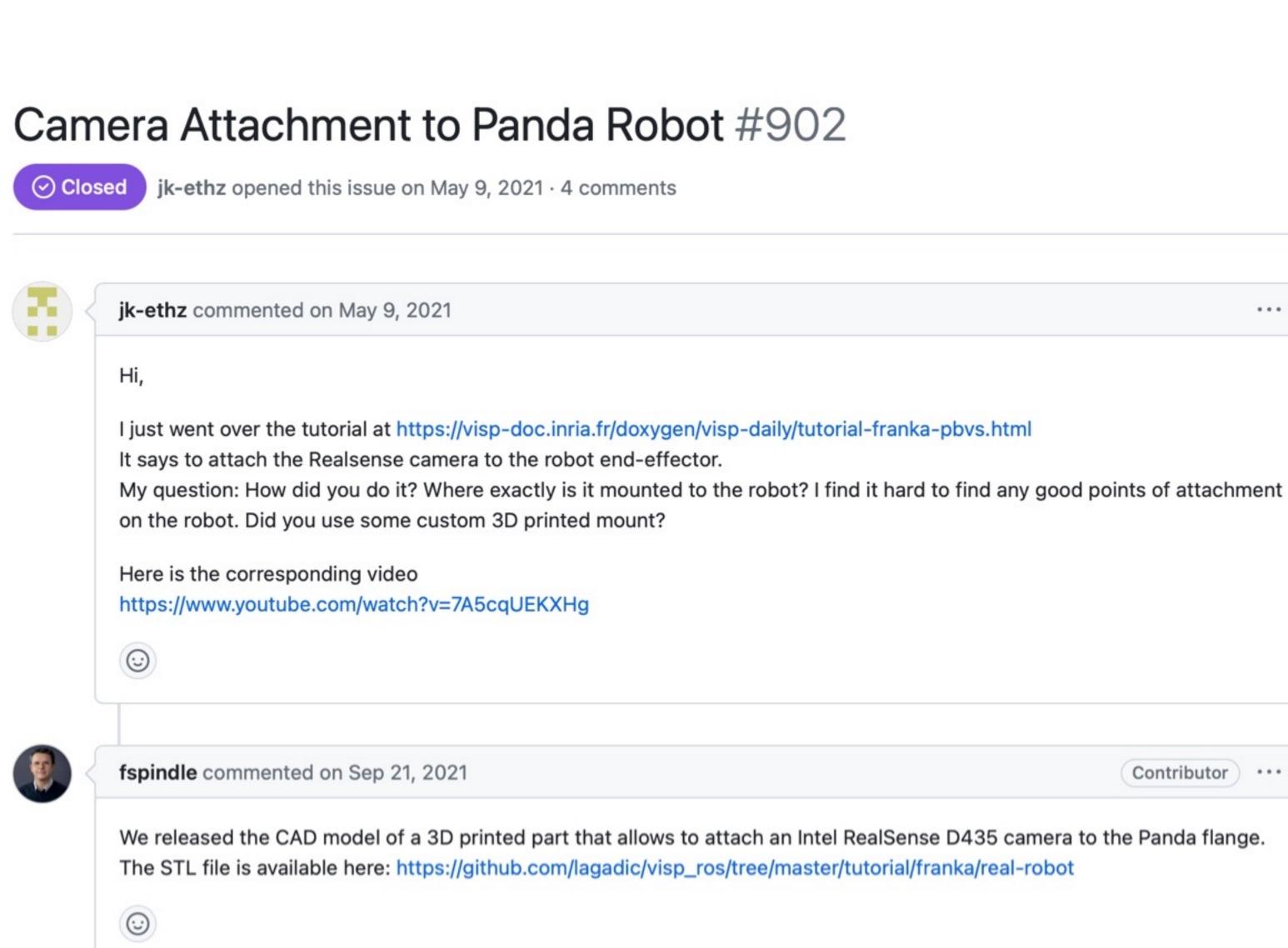


11. Watch on YouTube

A camera calibration demo they uploaded clearly shows the camera is attached to the robotic arm (at the same place we discussed in Depth Camera Mounting Analysis) using a custom-built component. In a GitHub issue, someone asked how does the team manage to mount the camera on the robotic arm

where they replyed claiming a custom 3D printed mount was designed to attach the Intel RealSense depth camera as they wanted. The team also released the STL file of the CAD model of a 3D printed part "that allows to attach an

Intel RealSense D435 camera to the Panda flange". CAD model STL file link: https://github.com/lagadic/visp_ros/tree/master/tutorial/franka/real-robot



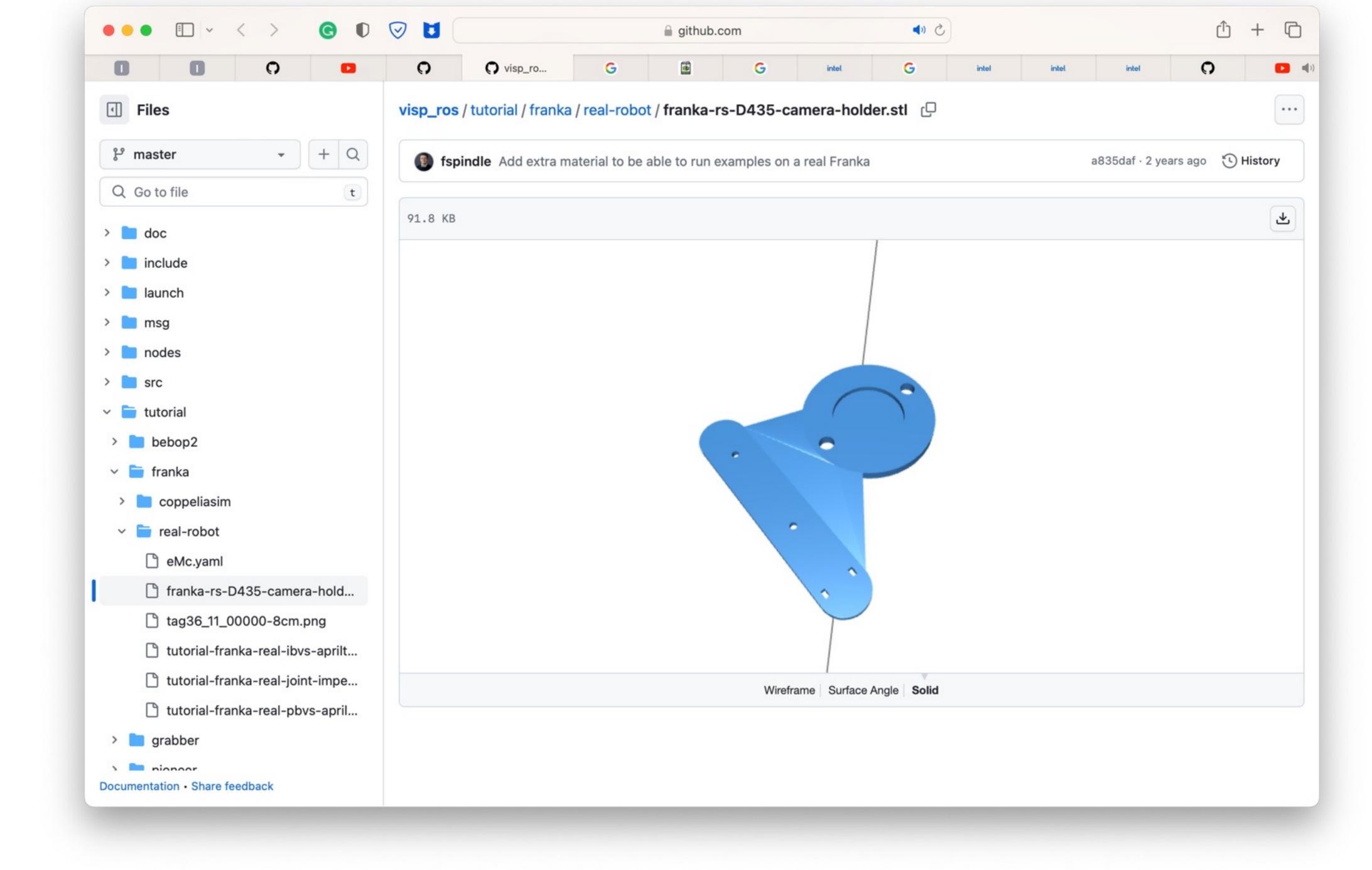
Visual servoing with Franka robot

Watch Later

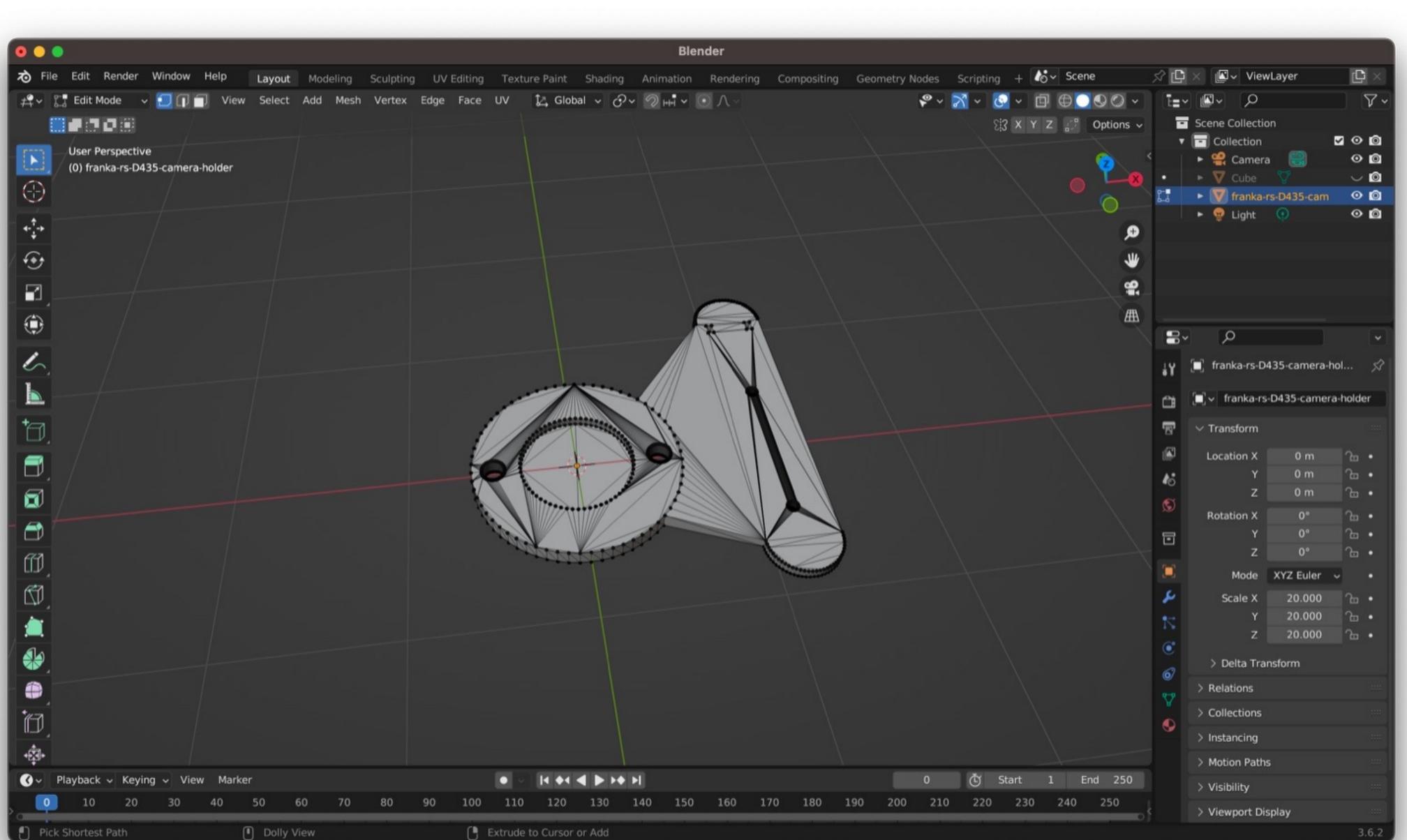
Share

Updated on iii 19 Sep 2023

The provided 3D model was downloaded and examined. Although the part was designed specifically for Intel RealSense D435if camera as well since their dimensions are almost the same as marked on tech spec pages. The D435 model has a dimension of (90 x 25 x 25 mm) while the D435if model has a dimension of (90 x 25.8 x 25 mm).



The STL model file can be open with 3rd party applications like Blender for more details and also further modifications if needed:



Issue:

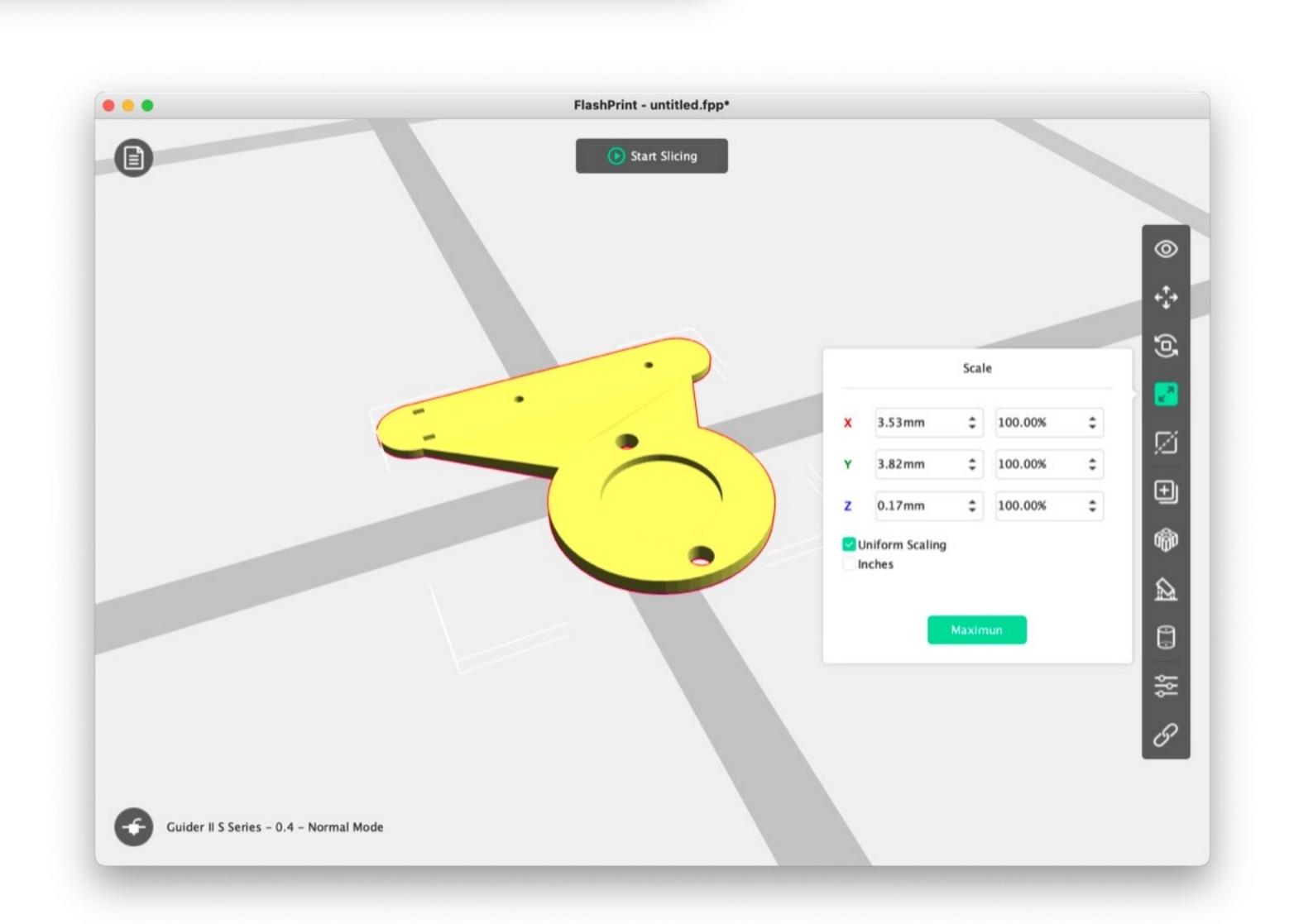
However, we noticed that the original model obtained from the given STL file is way too small. When the model was imported to the 3D printer software, the default dimensions for this model is only

(3.53 x 3.82 x 0.17 mm) like the image shown on the right. Although the model file provided by the team preserves the correct ratio for width, height and depth, it doesn't reflect the corresponding size in the real world.

3D printer software so that we can get a reasonable dimension of the mounting model. But the major problem here is that we don't know exactly how much we should scale the model so that

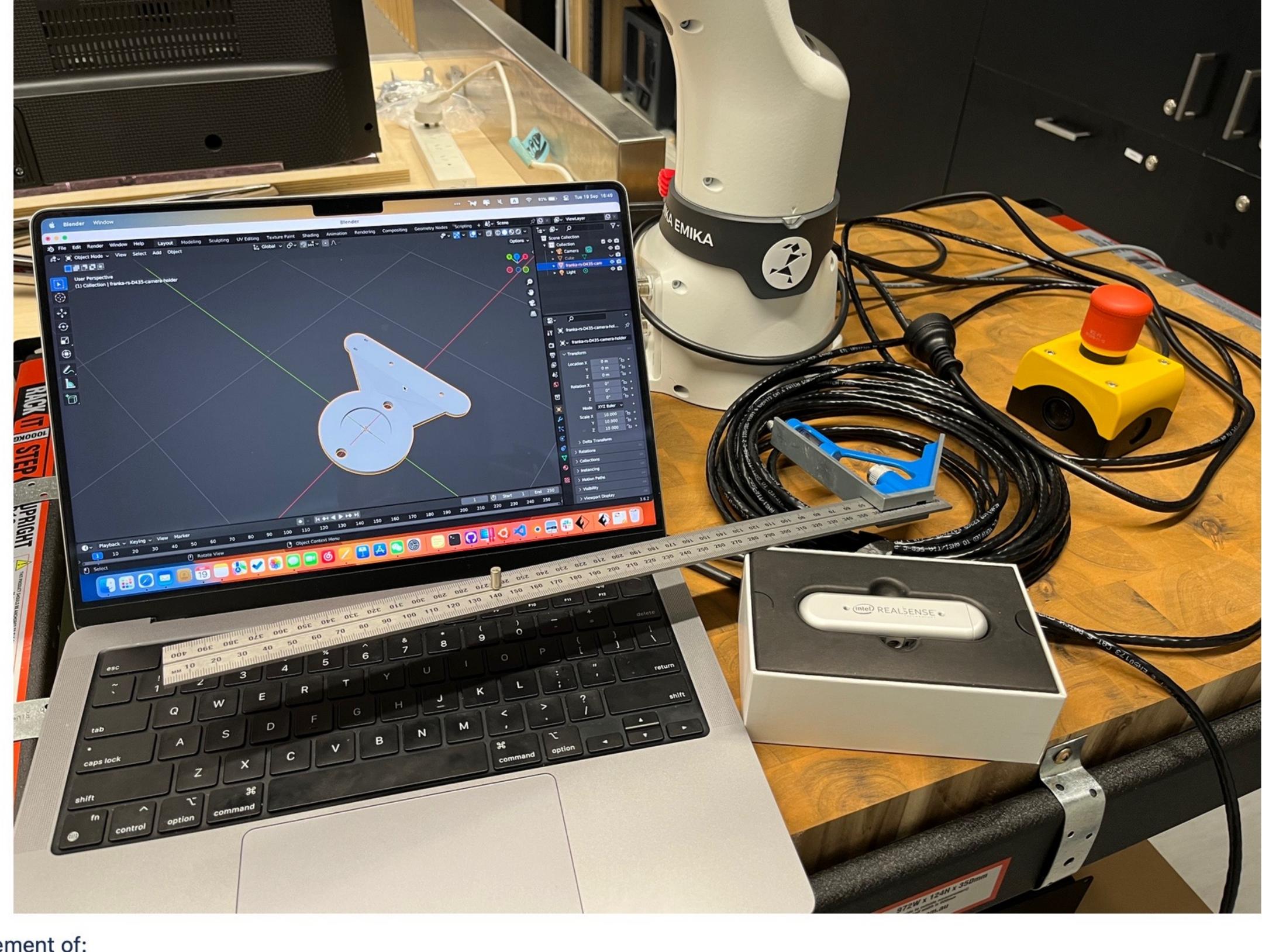
At this stage, the only thing we can think of is adjusting the scalling factor of the model directly in the

the model size matches what we expected to properly mount the camera on the robotic arm.



Updated on 📋 20 Sep 2023

Due to the inconsistent sclae ratio of the model, manual measurement is necessary in order to match the size we expected. We measured the distance between two screw holes on the back of RealSense depth camera. The distance is approxiamtely 4.5 cm and appears to match the screw holes on the end-effector of the robotic arm but we are not sure if it's possible/allowed to dissamble the parts of robotic arm.



The following photos showed the measurement of: 1. Distance between screw holes on the back of RealSense depth camera

- 2. Distance between screw holes on the end-effector of the robotic arm 3. These two seem to match (not sure whether useful)







model provided by the other team. So this is one of the clues we currently have to scale the model to correct size. To do that, we need to enlarge the model and ensure the distance between two smaller holes on the model maps to 4.5 cm in the real world (as the screenshot shown below).

