

FingerReplace Protocol

Overall task summary

The purpose of this task is to replace the right finger of the MobileRobot robot with a new one.

Full Video: <https://www.youtube.com/watch?v=rrSQJE37-Ds> (please watch first!)

NOTE: do not use your hand as shown in 0:22. Instead, there will be another spare finger on the table. Perform the mid-air handover necessary to let the right arm grasp the finger with the same angle.

Required props: A MobileRobot robot and a spare finger.

Resetting the scene





The MobileRobot robot should have its arm stretched out into the table. It should also be centered left-right with ± 10 cm (left image). The wrist of the MobileRobot should be slightly tilted (right image) to make insertion easier.

Every few episodes, move the base of the MobileRobot to randomize both left-right and the depth.

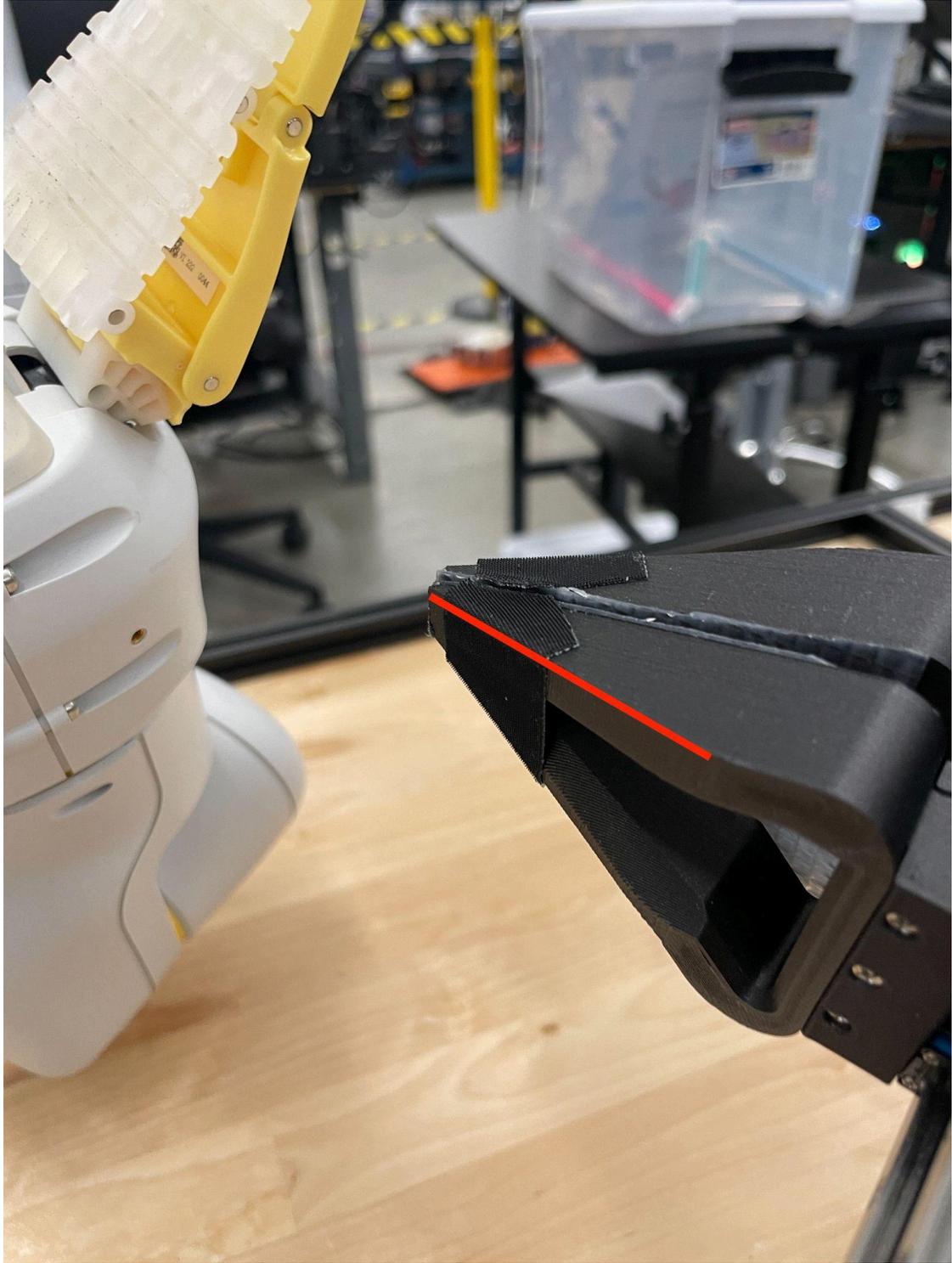
In addition to the base, **put the one extra MobileRobot finger on the right side of the table**, with random orientation and position.

Step by Step Instructions

This task requires precise manipulation of the MobileRobot finger. To avoid damaging it, follow the below steps/tips closely.

Before teleoperating the robot, try with your own hands to get a sense of the amount of force/direction of the force needed.

Step 1: prepare to remove the finger. Specifically, align the two red lines below.

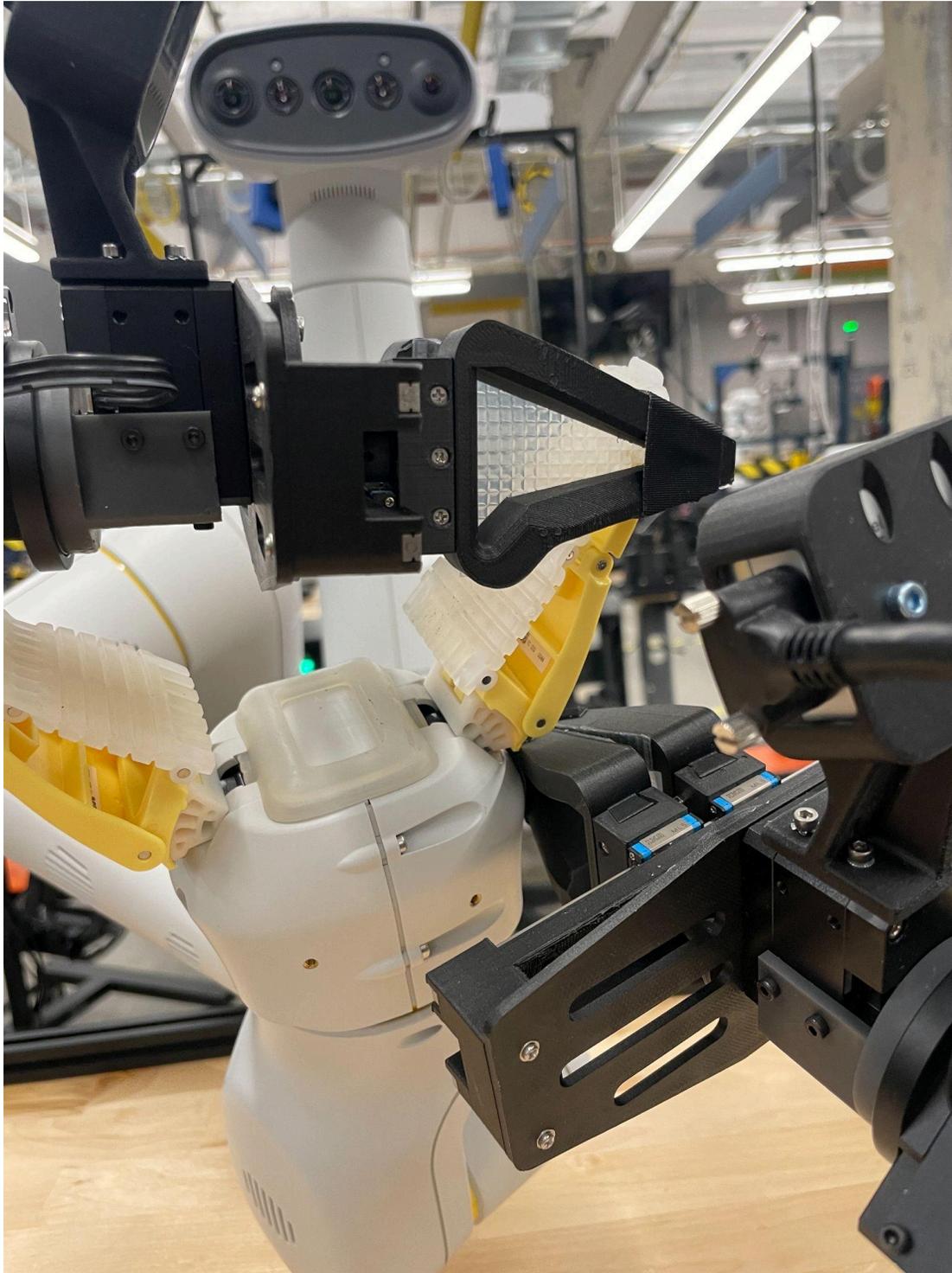






Step 2: grasp the MobileRobot finger tip with the left gripper, then use the right gripper to push out the finger.

The left gripper should not grasp too close to the palm of MobileRobot, so the left and right gripper are not fighting each other.



Step 3: place the finger on the left side of the table.

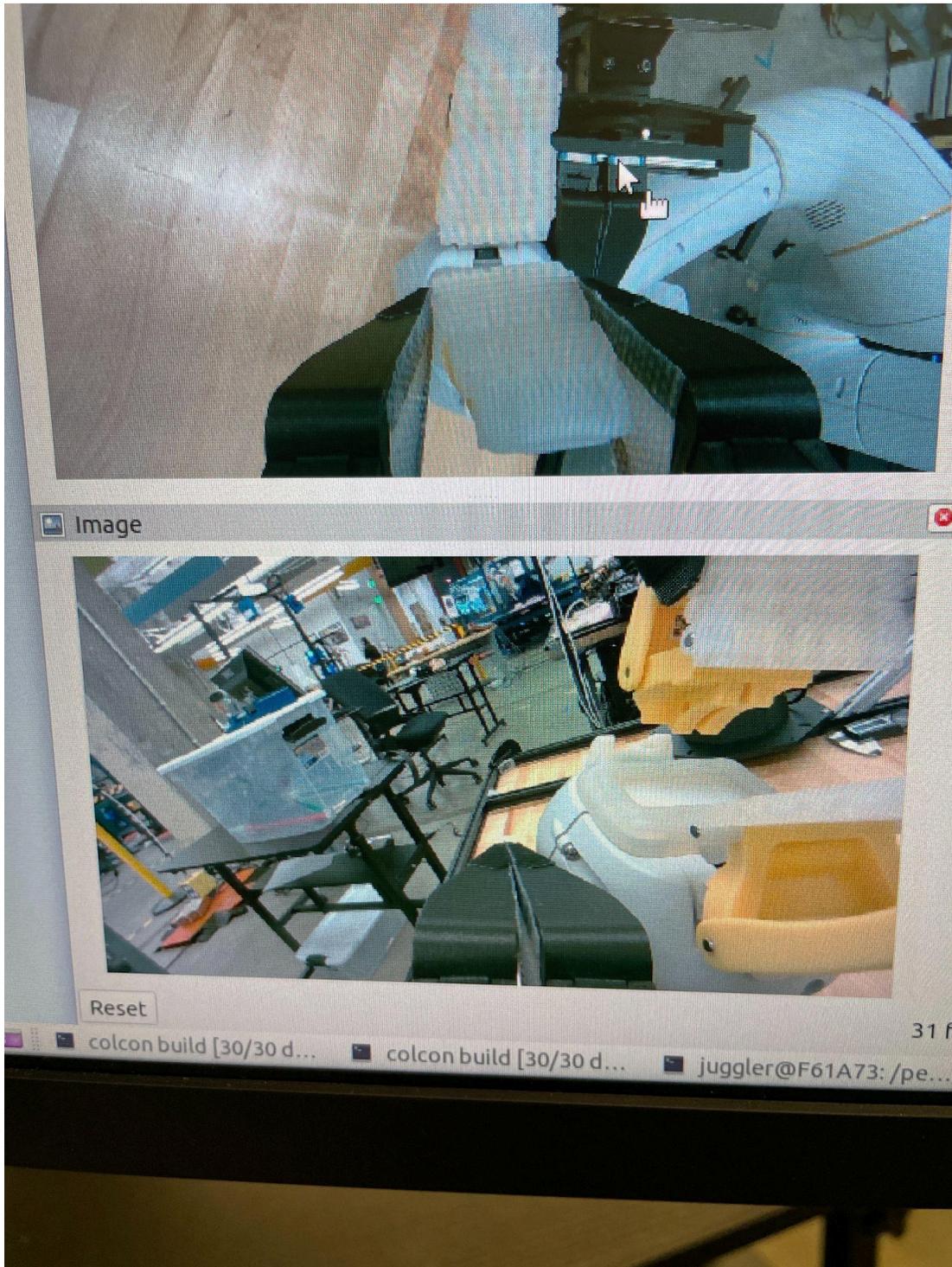
Step 4: pick up the new finger lying on the table (right side), perform the **mid-air handover** that is necessary so the finger aligns with the gripper as shown below.



Step 5 [IMPORTANT]: Move the left arm as an “observer”, so the slot is inside the wrist camera’s view.

The upper surface of the ALOHA gripper should align with the palm of the MobileRobot.





What the camera sees. Type in terminal "rviz2" to see above.

Step 6: With the left arm **fixed**, use the right arm to pick up and insert the gripper into the slot.

Failure Modes / FAQ

- How to reset in case of failure?
 - Reset the episode by pressing the left footpedal. Arms will reset to their starting positions at which time you can manually reset the scene with your hands.