

Run the URSIM in terminal

ros2 run ur_client_library start_ursim.sh -m ur10e

```
C95C7618128058305383815004040220C815076DCB5D1C3882E is not running
done
akhater@akhater-Precision-Tower-5810:~$ ros2 run ur_client_library start_ursim.s
h -m ur10e
ursim_net already exists
3c8dc95607bbf6d320af13fb45f34d6cae5e12b6e033b5342a23d15687eb6248
Docker URSim is running

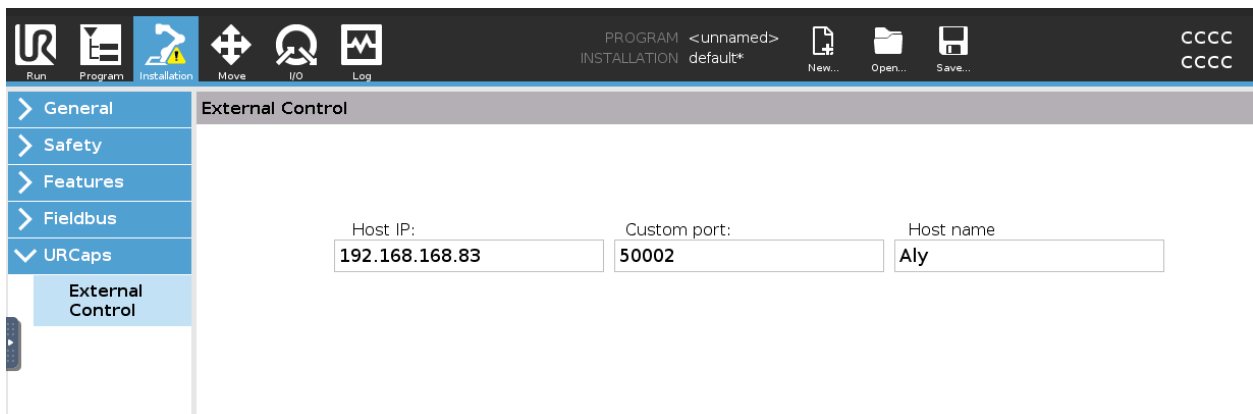
To access Polyscope, open the following URL in a web browser.
    http://192.168.56.101:6080/vnc.html

To exit, press CTRL+C
█
```

Open link <http://192.168.56.101:6080/vnc.html>

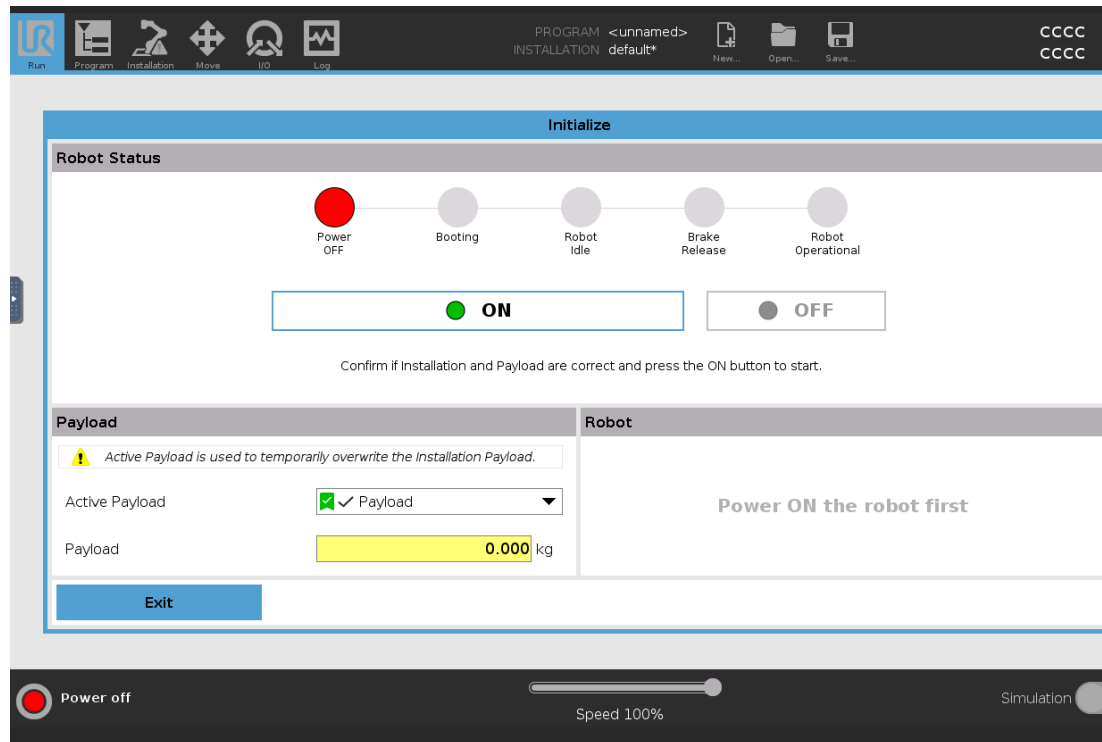
Connect

Go to Installation>URCaps>Host IP



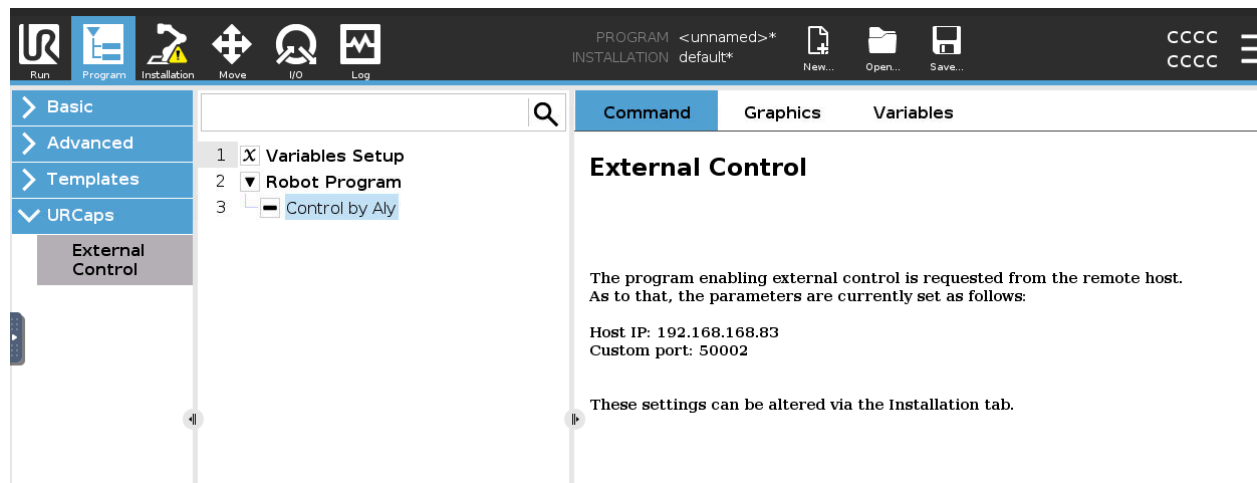
Input host computer IP. Keep port 50002

Power up the robot in the bottom left corner



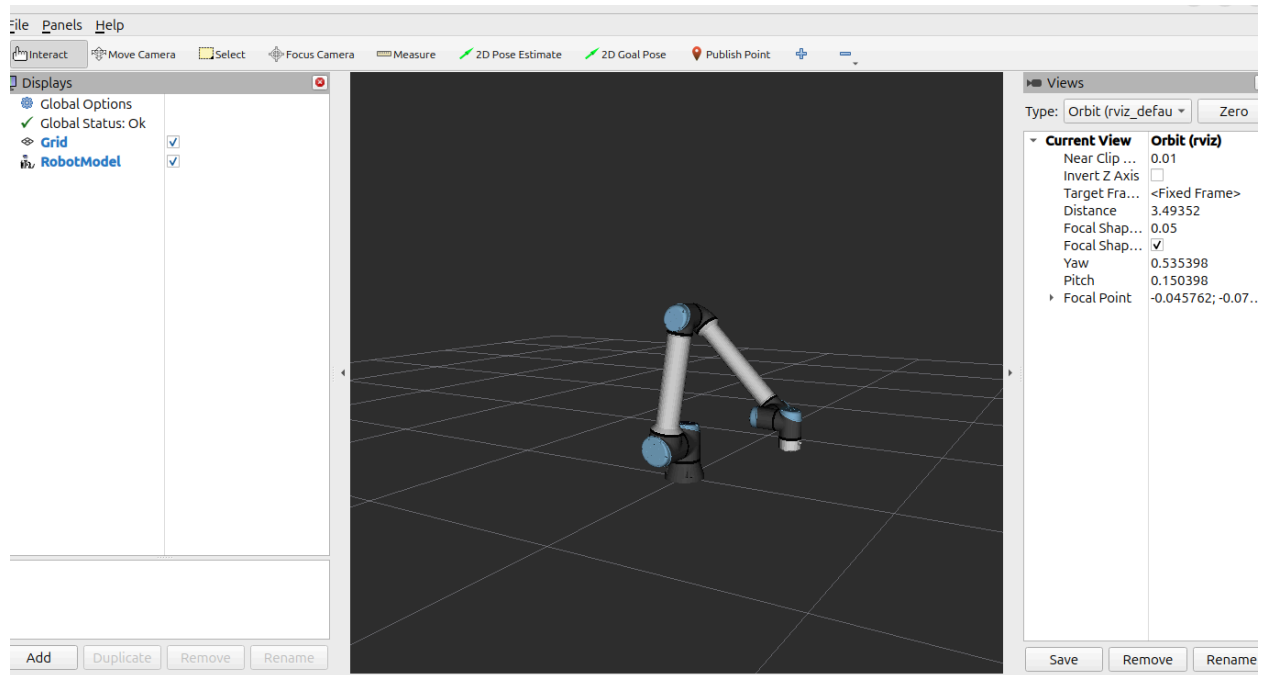
Turn it ON until Robot Operational is GREEN

Go to Program>URCaps and click on External Control. Screen should look like this

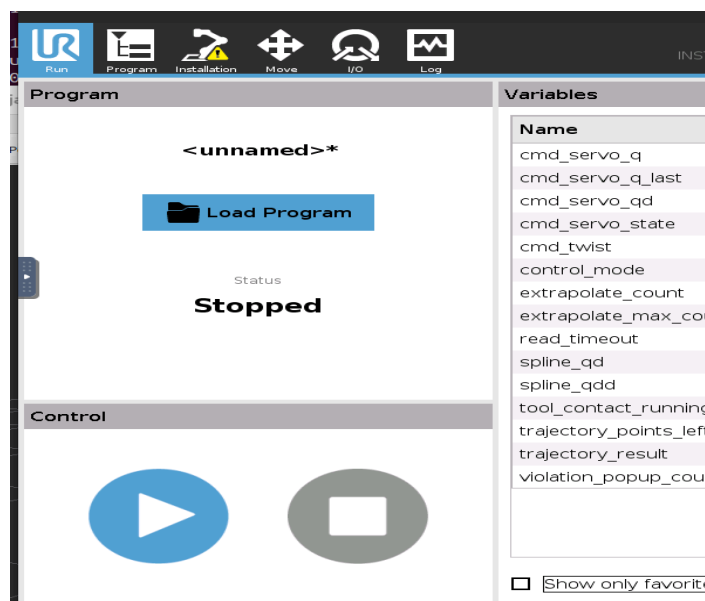


Control by Aly indicates that the program has been set up for external control.

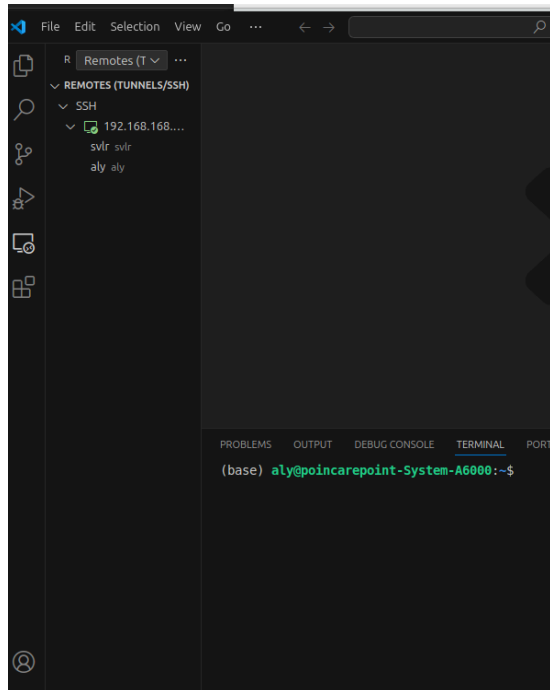
Go back to the terminal, open a new terminal and run the drivers
 ros2 launch ur_robot_driver ur_control.launch.py ur_type:=ur10e robot_ip:=192.168.56.101
 launch_rviz:=true
 An RVIZ model of the ur10 will now show up according to the position in the sim



Go back to the URSim, in the RUN tab, hit the play button. The status should change to RUNNING



Open up VSCode, use the Remote Extension to connect to the Remote server in HMI2 Lab. It will request a password.



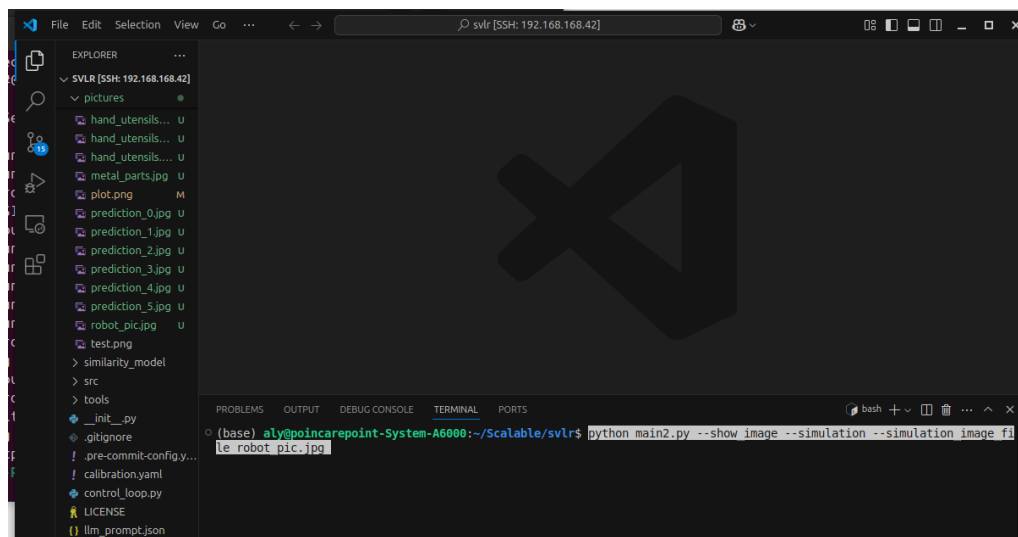
In the vscode terminal, do the following commands. (if the environment has been set up already)

```
conda activate svlr  
cd Scalable/svlr
```

In the vscode remote, run the following

```
python main2.py --show_image --simulation --simulation_image_file robot_pic.jpg
```

Note: The image can be an image uploaded to the Scalable/svlr/pictures folder on the remote server



This will run the Server, and it will be waiting for a client to connect (the host pc)
Now go back to the host pc terminal and go to
cd Desktop/urscripts

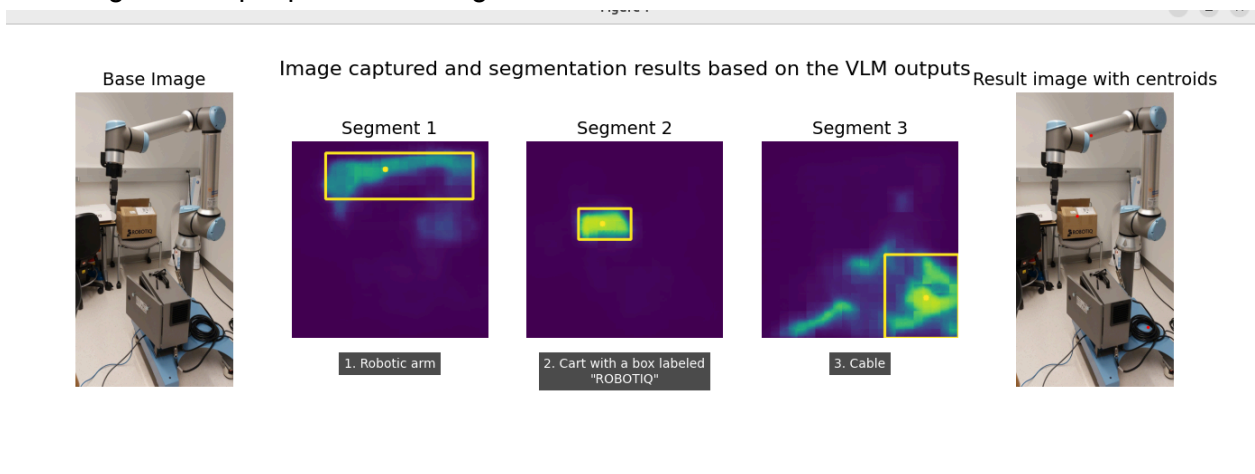
Run the following in the terminal
python3 remote_send_sim.py

```
akhater@akhater-Precision-Tower-5810:~/Desktop/urscripts$ python3 remote_send_sim.py
ModuleNotFoundError: No module named 'cv2'
• (base) aly@poincarepoint-System-A6000:~/Scalable/svlr$ conda activate svlr
• (svlr) aly@poincarepoint-System-A6000:~/Scalable/svlr$ conda activate svlr
• (svlr) aly@poincarepoint-System-A6000:~/Scalable/svlr$ python main2.py --show_image --simulation --simulation_image_file robot_pic.jpg
Server listening on 0.0.0.0:8000
```

Go back to the server terminal, it will request for user input from the image given. You can tell it to move a specific object in the image.

```
main2.py u le robot_pic.jpg
Server listening on 0.0.0.0:8000
Accepted connection from ('192.168.168.83', 39230)
Control loop initialized
Write 'stop' if you want to stop the program
User input: Move the robot arm to the box
```

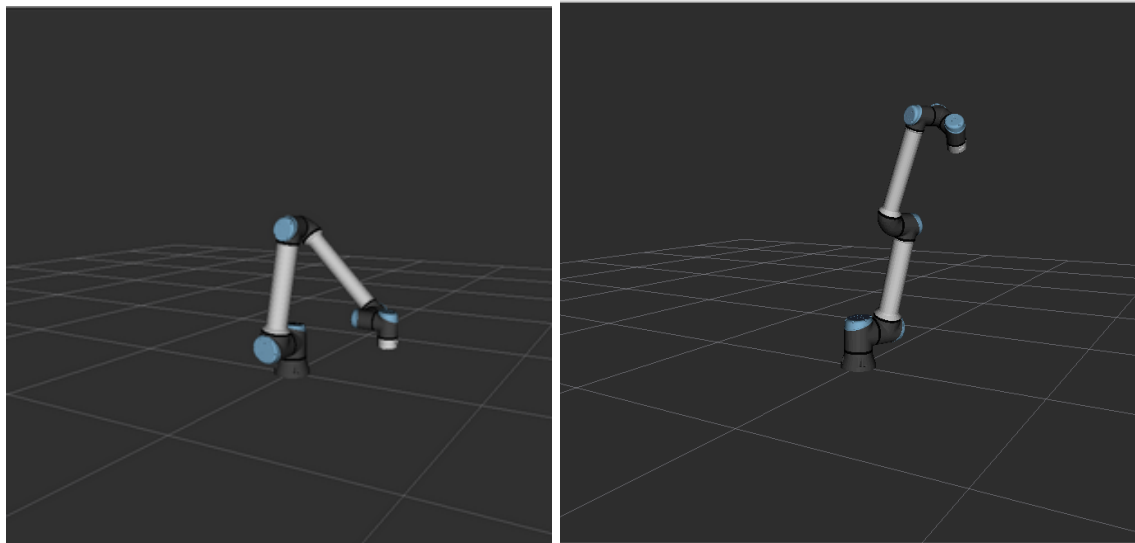
You will get an output picture and segmentation from the VLM



The server terminal will then output the actions needed to perform the task. It will send the actions and positions to the client (host pc) to send the command to the UR10 robot

```
...0004761]], 'gripper': 220}}]
akhter@akhter-Precision-Tower-5810:~/Desktop/urscripts$ python3 remote_send_si
m.py
Connected to server at 192.168.168.42:8000
Received action: [{'pos_end_effector': [1.139248570526187, -1.268890909119421, 0
.12843, 0.1247397, -0.9921894, 0, -0.0004761, 0.1247397, -0.9921894, 0, -0.00047
61], 'gripper': 220}]
Sending command: movej([1.139248570526187, -1.268890909119421, 0.12843, 0.124739
7, -0.9921894, 0], a=0.1, v=0.1, t=20)
Command sent successfully.
[
[{'pos_end_effector': [1.139248570526187, -1.268890909119421, 0.12843, 0.1247397, -0.9921894, 0, -0.0004761, 0.1247397
, -0.9921894, 0, -0.0004761], 'gripper': 220}]
Control Loop - Time taken: 7.569931268692017
Action: [{'pos_end_effector': [1.139248570526187, -1.268890909119421, 0.12843, 0.1247397, -0.9921894, 0, -0.0004761, 0
.1247397, -0.9921894, 0, -0.0004761], 'gripper': 220}]
Write 'stop' if you want to stop the program
User input: [
```

The robot should have moved



Before(left) and after(right)