14. Color block identification and transportation

14.1. Use

Note: [R2] on the remote control handle has the [pause/start] function for this gameplay. When using it for the first time, perform color calibration first.

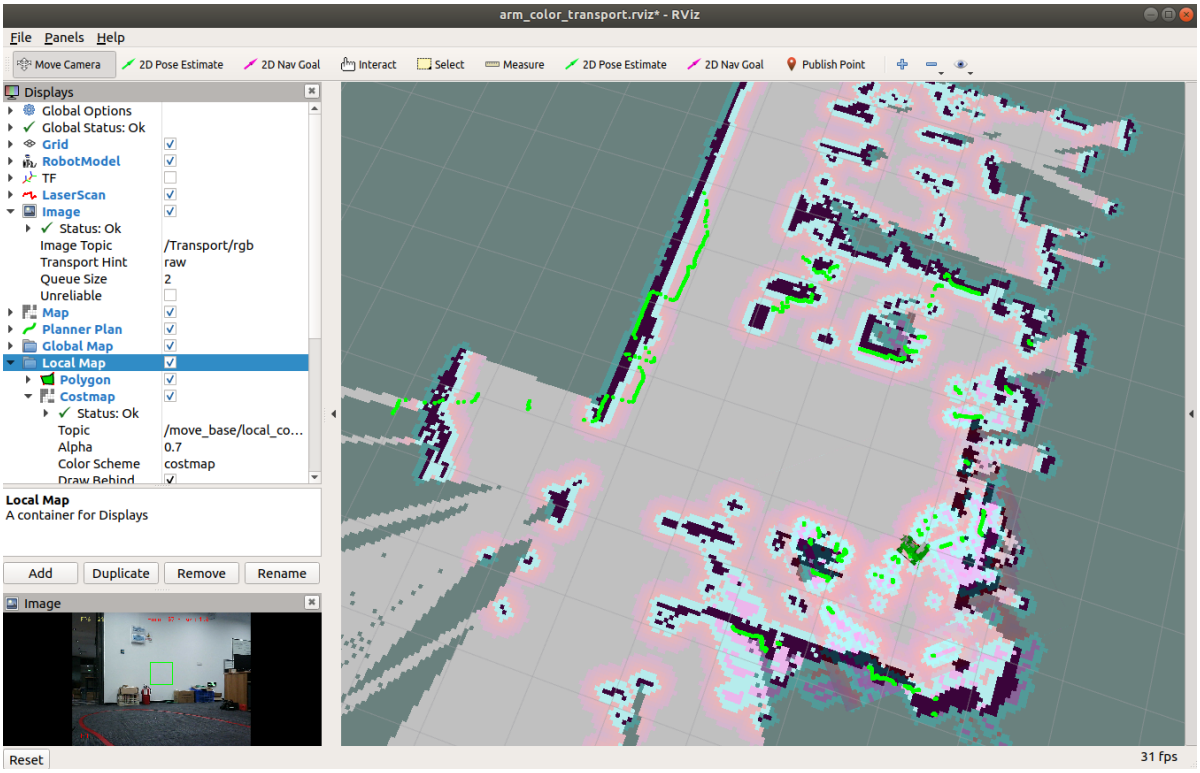
The prerequisite for using this function is that there is a map that has been built, and the Astra camera is enabled by default.

```
#Raspberry Pi 5 master needs to enter docker first, please perform this step
#If running the script into docker fails, please refer to ROS/07, Docker tutorial
~/run_docker.sh
```

Start command (robot side)

```
roslaunch arm_color_transport transport_base.launch map:=my_map img_show:=false #
Robot
roslaunch arm_color_transport transport_rviz.launch # Virtual machine
```

- Parameter map: the name of the loaded map.
- Parameter img_show: whether to open the image window separately.

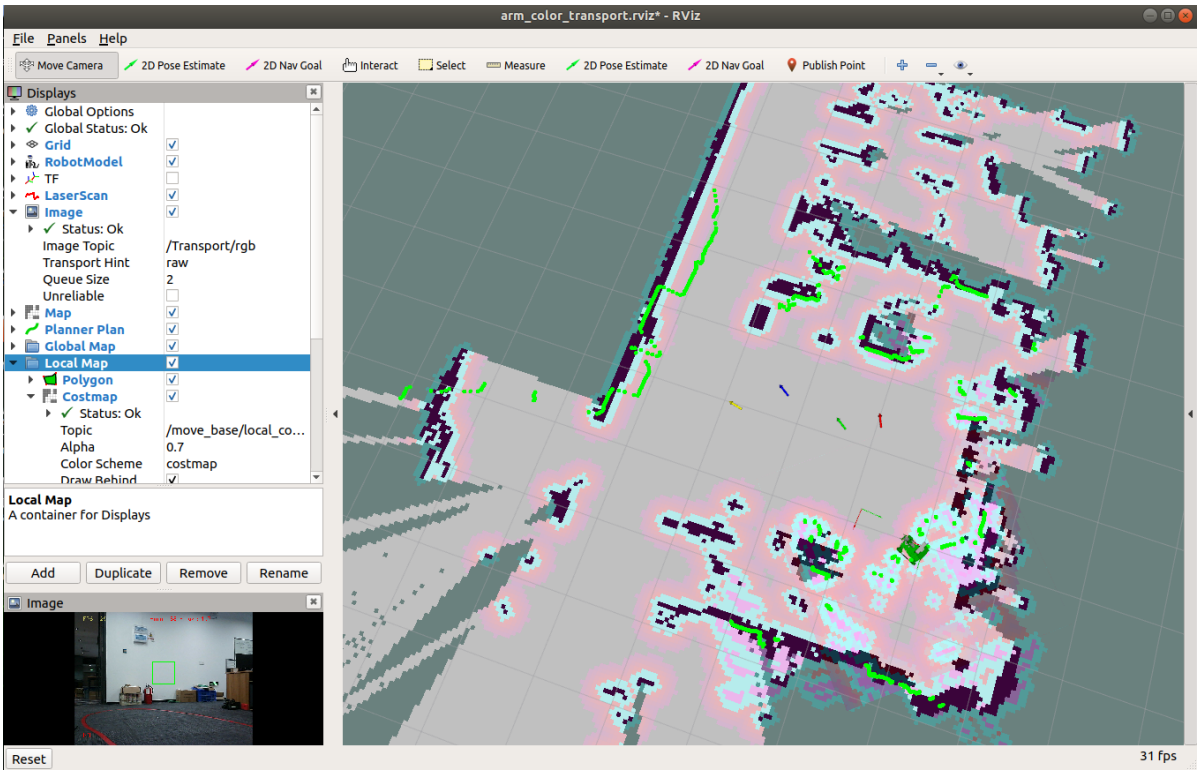


The system recognizes the topic name of the color block [/Transport/rgb].

14.1.1. The first step

position

- [2D Pose Estimate] on the left side of [rviz] locates the pose of the robot in the map, which is the same as general navigation.
- [2D Nav Goal] on the left side of [rviz] is generally not used, it is the same as general navigation.
- [2D Pose Estimate] on the right side of [rviz], set the return pose of the robot after completing the transportation.
- [2D Nav Goal] on the right side of [rviz], set the target pose that needs to be carried after the robot recognizes the color block. You can set [red, green, blue, yellow] in a cycle.
- [Publish Point] in [rviz] clears the target pose and return pose set by the robot.



14.1.2. Step 2

If the Setup Image window is open it can be controlled using keyboard keys.

Start function (choose 1 from 2)

- Select the image window and hit the space bar on your keyboard.
- Click the controller [R1] button twice within 0.5 seconds.

Other keyboard key controls (selected image window)

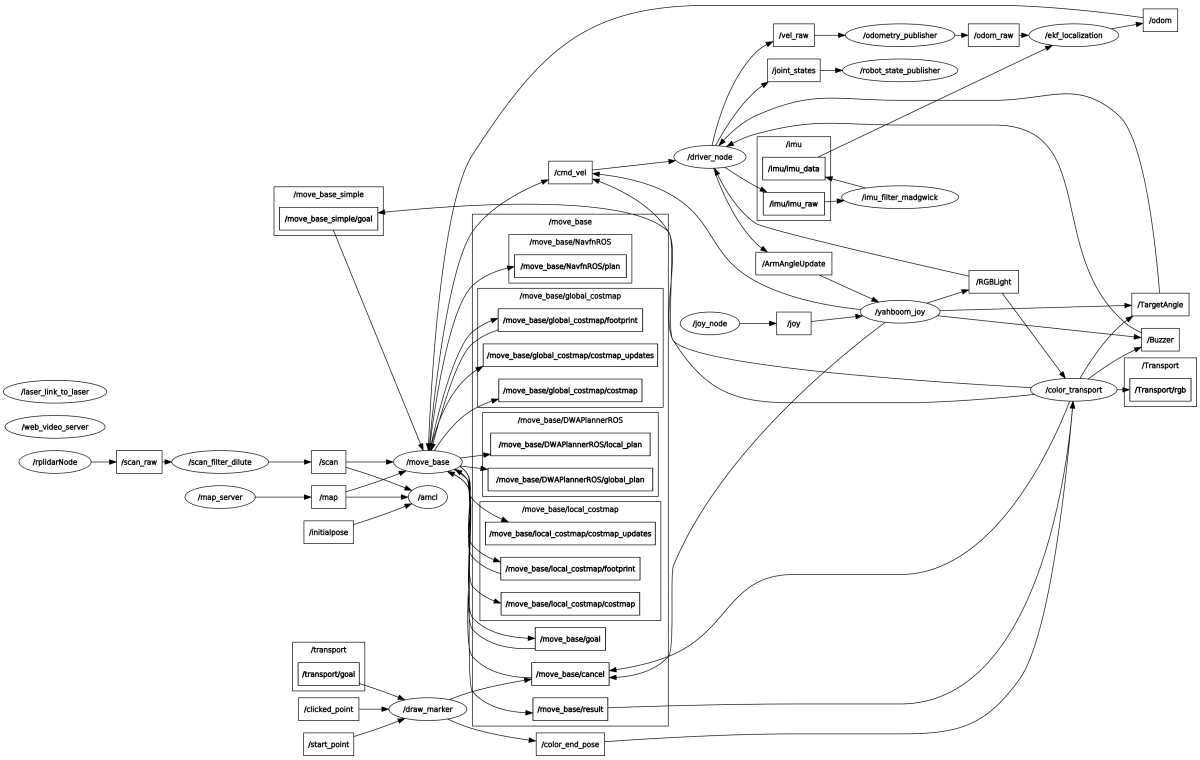
- Click the [Space] key: start recognition.
- Click the [r] key: parameters restore to default settings.
- Click the [q] key: cancel navigation and exit the program.

14.1.3. The third step

- Place the color block into the recognition frame in front of the camera and completely fill the recognition frame,
- The system automatically recognizes the color of the color block and whistles to signal that it is ready to be picked.
- When the clamping jaws open, put the color block into the clamping jaws,
- The robotic arm clamps the color block and moves it autonomously to the target position of the corresponding color set in advance.

14.2, Node graph

```
rqt_graph
```



14.3, flow chart