2. AR Vision

1. Overview

Augmented Reality, referred to as "AR", is a technology that cleverly integrates virtual information with the real world. It widely uses multimedia, three-dimensional modeling, real-time tracking and registration, intelligent interaction, sensing and other technical means to simulate computer-generated text, images, three-dimensional models, music, video and other virtual information and apply them to the real world. The two types of information complement each other, thereby achieving "enhancement" of the real world.

The AR system has three outstanding characteristics: ① Information integration of the real world and the virtual world; ② Real-time interactivity; ③ Adding and positioning virtual objects in three-dimensional space.

Augmented reality technology includes new technologies and new means such as multimedia, three-dimensional modeling, real-time video display and control, multi-sensor fusion, real-time tracking and registration, and scene fusion.

2. Usage

There are 12 effects in this section.

```
["Triangle", "Rectangle", "Parallelogram","WindMill","TableTennisTable",
"Ball","Arrow", "Knife", "Desk","Bench", "Stickman", "ParallelBars"]
```

3. Start command

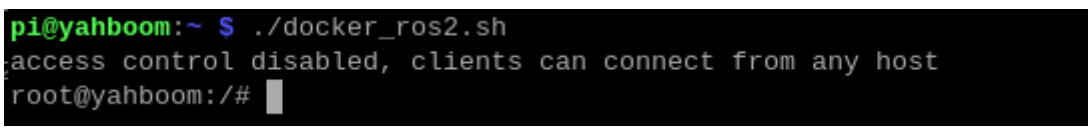
Code reference path,

```
/root/yahboomcar_ws/src/yahboomcar_visual/yahboomcar_visual/simple_AR.py
```

Open a terminal and enter the following command to enter docker,

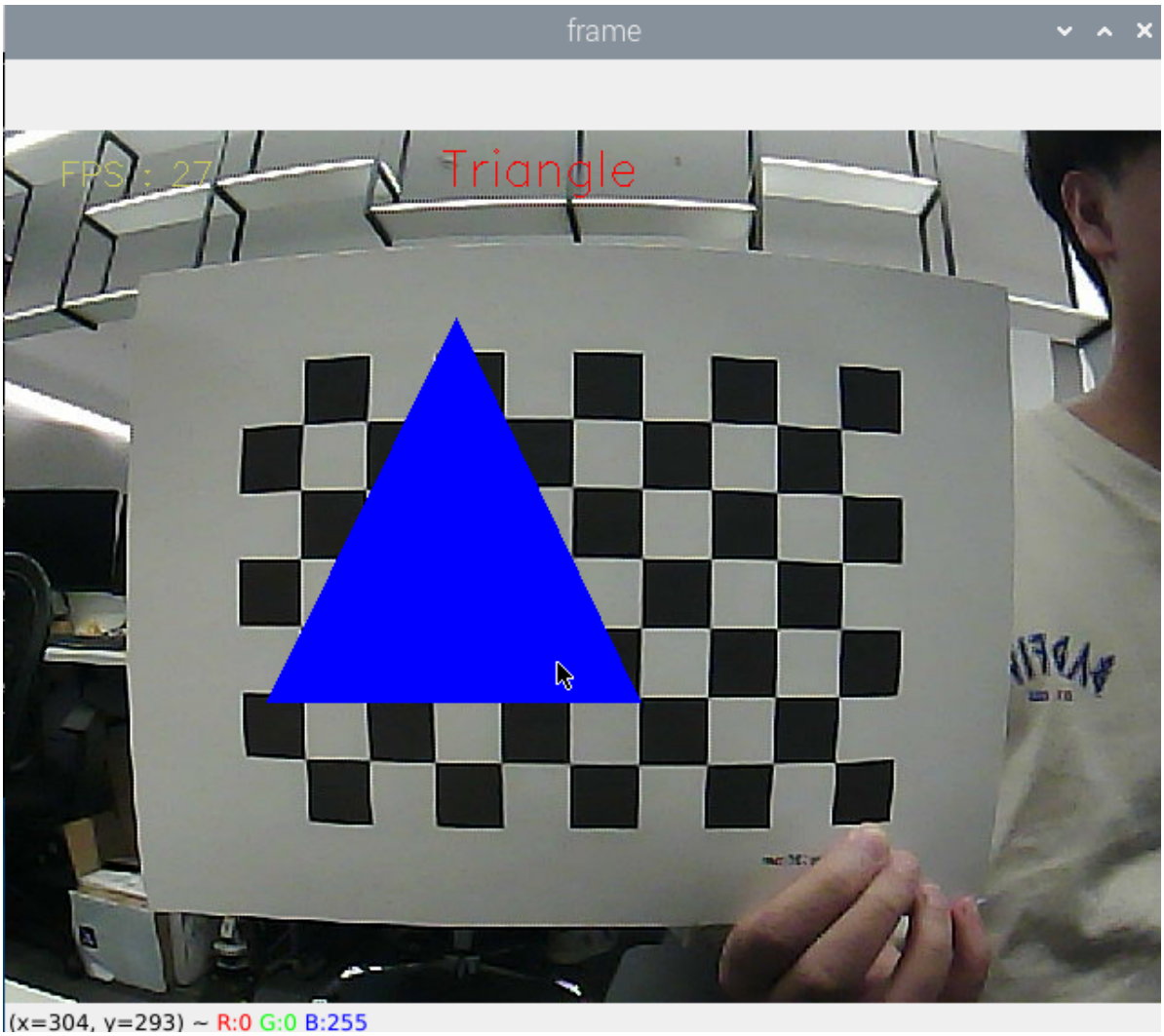
```
./docker_ros2.sh
```

The following interface appears, which means that you have successfully entered Docker. Now you can control the car through commands.



After entering the docker container, enter in the docker terminal,

```
ros2 run yahboomcar_visual simple_AR
```



Press [q] to exit, and press [f] to switch different effects.

3.1.1, ROS deployment

ROS is also deployed in this course, which mainly has the following two functions:

- Subscribe to topic data and switch different effects
- Publish images

View ros topics with the following commands,

Open a new terminal, enter the same docker, and modify the following da8c4f47020a to the ID displayed in the actual terminal

```
docker ps
```

```
docker exec -it da8c4f47020a   /bin/bash
```

```
pi@yahboom:~ $ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED       STATUS
    PORTS     NAMES
da8c4f47020a   yahboomtechnology/ros-humble:0.0.4   "/ros_entrypoint.sh …"   8 hours ago   Up 45 minute
s             festive_payne
pi@yahboom:~ $ docker exec -it da8c4f47020a /bin/bash
root@yahboom:/#
```

Enter in the docker terminal:

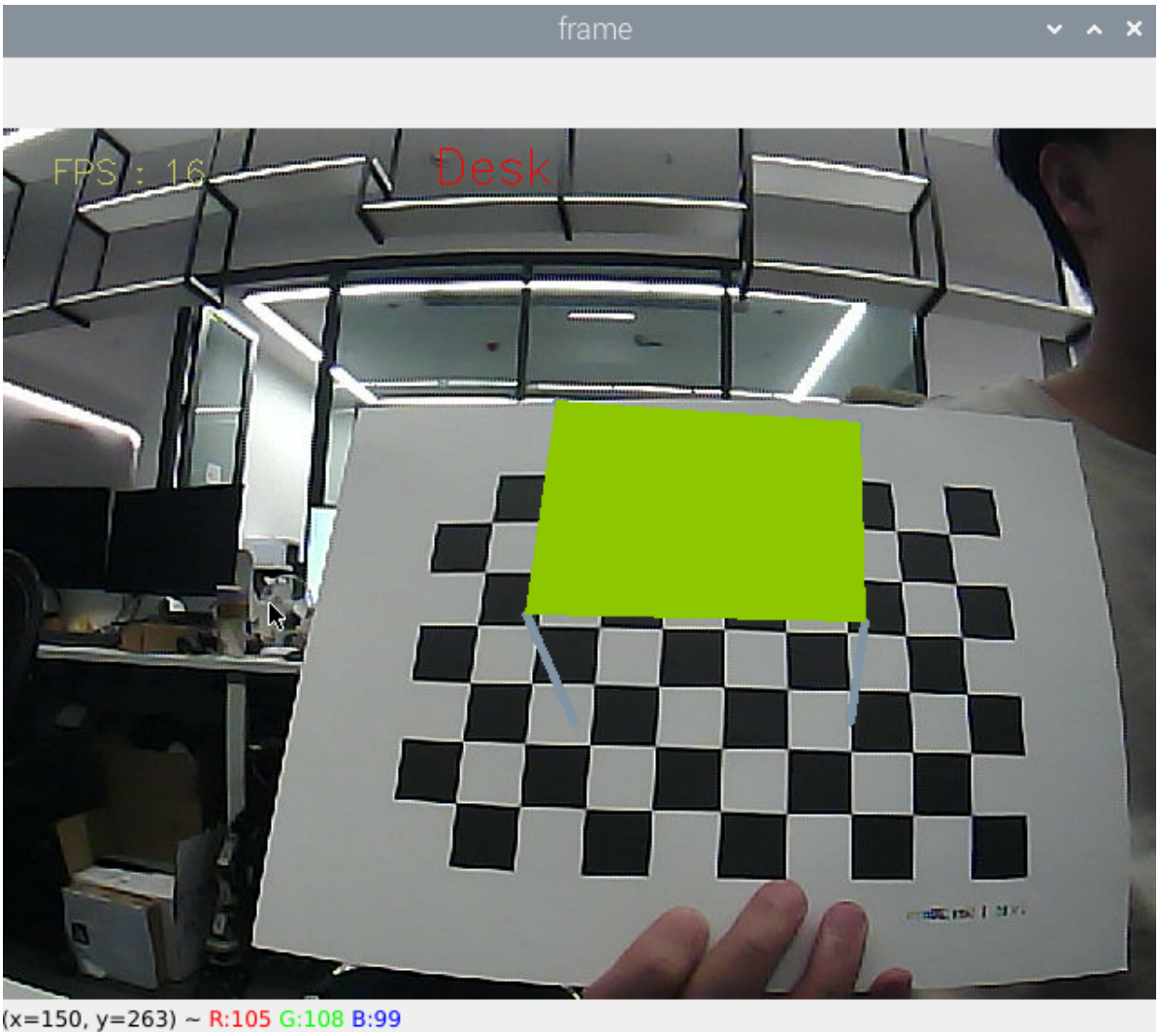
```
ros2 topic list
```

```
root@yahboom:~# ros2 topic list
/Graphics_topic
/parameter_events
/rosout
/simpleAR/camera
```

- /Graphics_topic: the topic name of the effect, subscribe to the effect to be identified.
- /simpleAR/camera: the topic name of the image, publish the image.

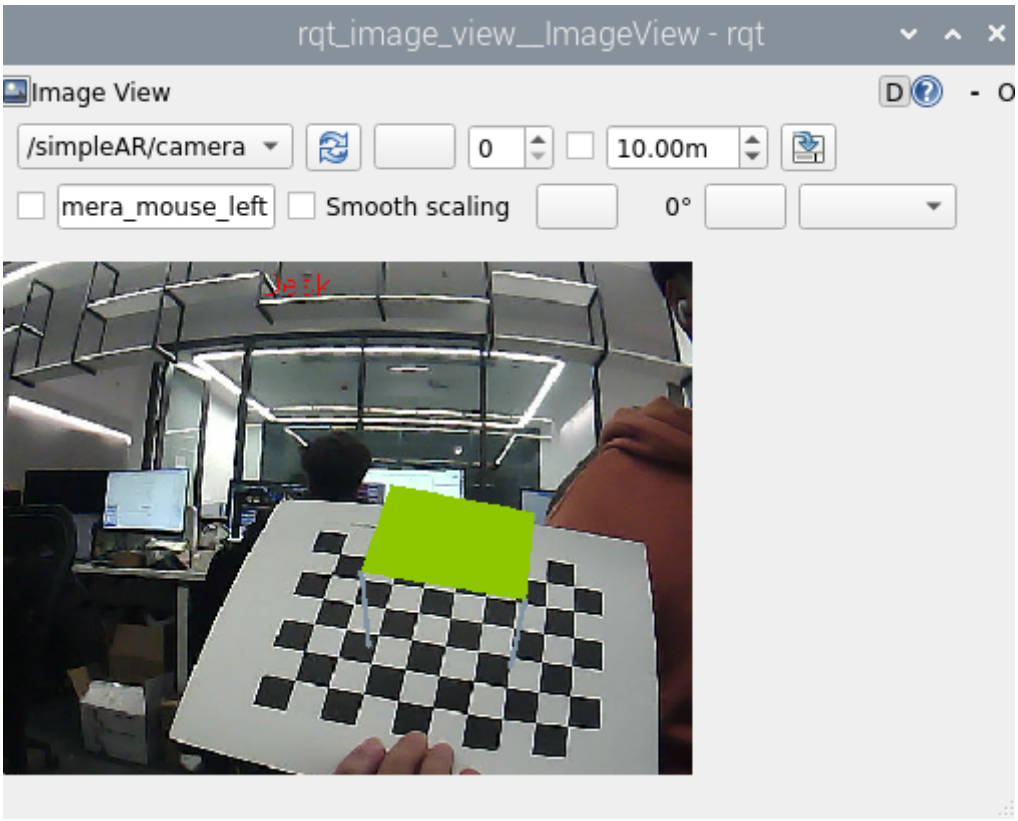
To modify the effect, you can use the following command to modify it. For example, I first changed it to Desk and entered it in the docker terminal,

```
ros2 topic pub /Graphics_topic std_msgs/msg/String "data: Desk"
```



To view the published image, you can use rqt_image_view to view it. Enter in the docker terminal,

```
ros2 run rqt_image_view rqt_image_view
```



Select /simpleAR/camera in the upper left corner to view the image.