2. TensorRt acceleration identification mark

Note: This course is only applicable to the R2L car and Yahboom's autopilot map.

If you use other models or other maps, you need to develop and debug the code yourself, and the code provided in this chapter cannot be used directly.

1. tensorrt deployment process

1.2. Generate .wts file

Copy the best.pt generated in the previous lesson to the ~/software/yolov5-5.0 file, open the terminal,

```
python3 gen_wts.py -w best.pt
```

Copy the generated best.wts file to tensorrtx_yolov5_jetson directory, and compile tensorrtx in this directory, terminal input,

```
mkdir build && cd build && cmake ..
```

Change the CLASS_NUM in yololayer.h to 11, **11 here indicates how many kinds of traffic signs there are**, we trained 11 kinds, so it is 11. The official data set is coco, which is 80 by default. Execute makeFile. (**Every time you modify it to CLASS_NUM, you must make it once**) Terminal input,

```
make -j4
```

1.3. Generate .engine file

Generate .engine file, terminal input,

```
sudo ./yolov5 -s ../best.wts yolov5s.engine s
```

After running, **libmyplugins.so** and **yolov5s.engine** will be generated in the ~/software/tensorrt_yolov5_jetson/build directory, copy these two files to the yahboomcar_yolov5 function package param/nano4G folder (Take nano4G as an example, it needs to be modified according to the specific master control).

1.4. Write yaml file

In the ~/yahboomcar_ws/src/yahboomcar_yolov5/param directory, create a new yaml file named traffic.yaml, and copy the following content into the file,

```
PLUGIN_LIBRARY: libmyplugins.so
engine_file_path: yolov5s.engine
CONF_THRESH: 0.5
IOU_THRESHOLD: 0.4
categories:
["Go_straight","Turn_right","whistle","Sidewalk","Limiting_velocity","Shutdown",
"School_decelerate","Parking_lotB","Parking_lotA","Green_light","Red_light"]
```

1.5. Modify the yolov5.py code

Modify yolov5.py in the ~/yahboomcar_ws/src/yahboomcar_yolov5/scripts directory, and change the value of file_yaml to the newly created traffic.yaml, as shown below,

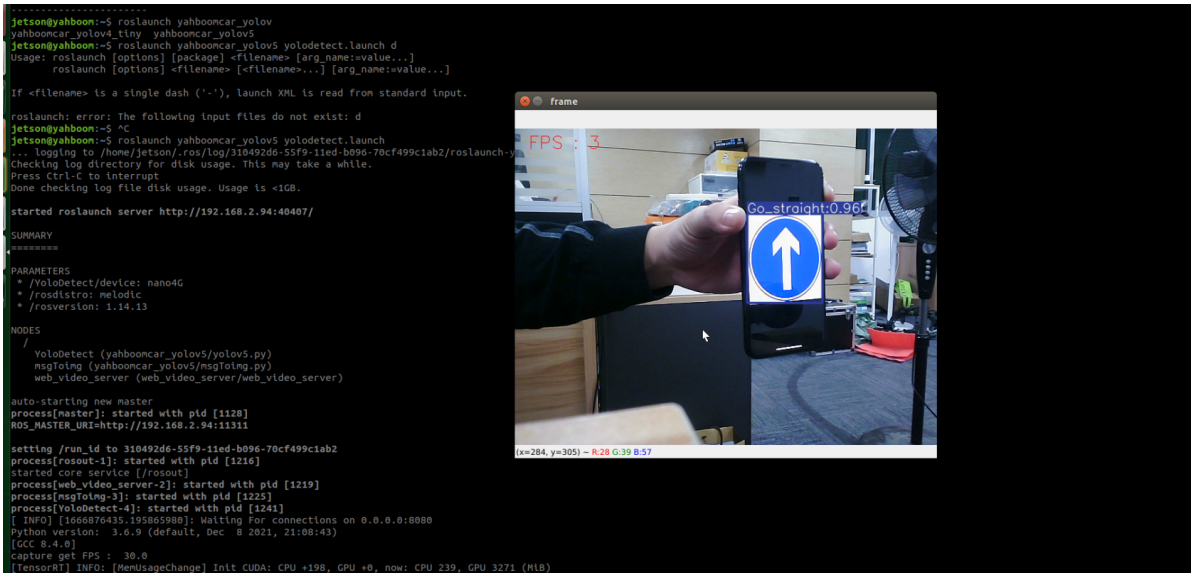
```
file_yaml = param_ + 'traffic.yaml'
```

2. Test run

Take nano as an example, terminal input,

```
roslaunch yahboomcar_yolov5 yolodetect.launch device:=nano4G
```

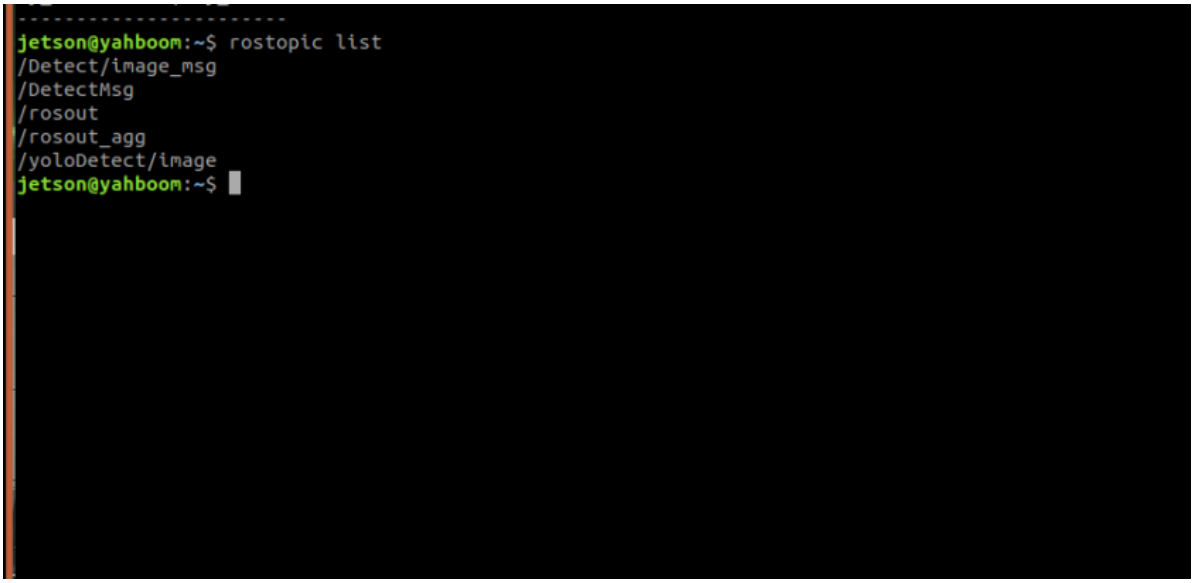
As shown below,



Use rostopic list to view topics, terminal input,

```
rostopic list
```

As shown below,



We can see that there is a topic /DetectMsg, which is the specific information of the recognized traffic sign. Use rostopic echo to view the specific information of the message, terminal input,

```
rostopic echo /DetectMsg
```

As shown in the figure below, the red frame is the specific information of the identified sign, including the frame_id, which is the category, score, center coordinates, etc. In the following program, as long as we subscribe to this topic, we can get these data.