7. Voice control multi-point navigation

7.1. Description

On the established map, voice control ROSMASTER to navigate to point1, point2, point3. The R2 key on the handle can stop/start this function at any time.

7.2. Steps

7.2.1. Function package path

```
~/yahboomcar/src/yahboomcar_voice_ctrl/
```

7.2.2. Calibrate the target point

robot side

```
roslaunch yahboomcar_nav laser_bringup.launch  #laser + yahboomcar
roslaunch yahboomcar_nav yahboomcar_navigation.launch use_rviz:=false map:=house
# start navigation, change house to the map name of the map
```

[use_rviz] parameter: whether to open rviz.

[map] Parameters: map name, the map to be loaded.

Open the visual interface (virtual machine side)

```
roslaunch yahboomcar_nav view_navigate.launch
```

1. In the map rviz, adjust the initial posture of ROSMASTER;

2. terminal input

```
rostopic echo /move_base_simple/goal
```

3. Using the 2D Nav Goal tool in rviz, a target point of the car is given in rviz, which is recorded as position 1. At this time, the coordinates of the target point will be printed out in the

terminal window that just viewed the data of/move_base_simple/goal. As shown below.
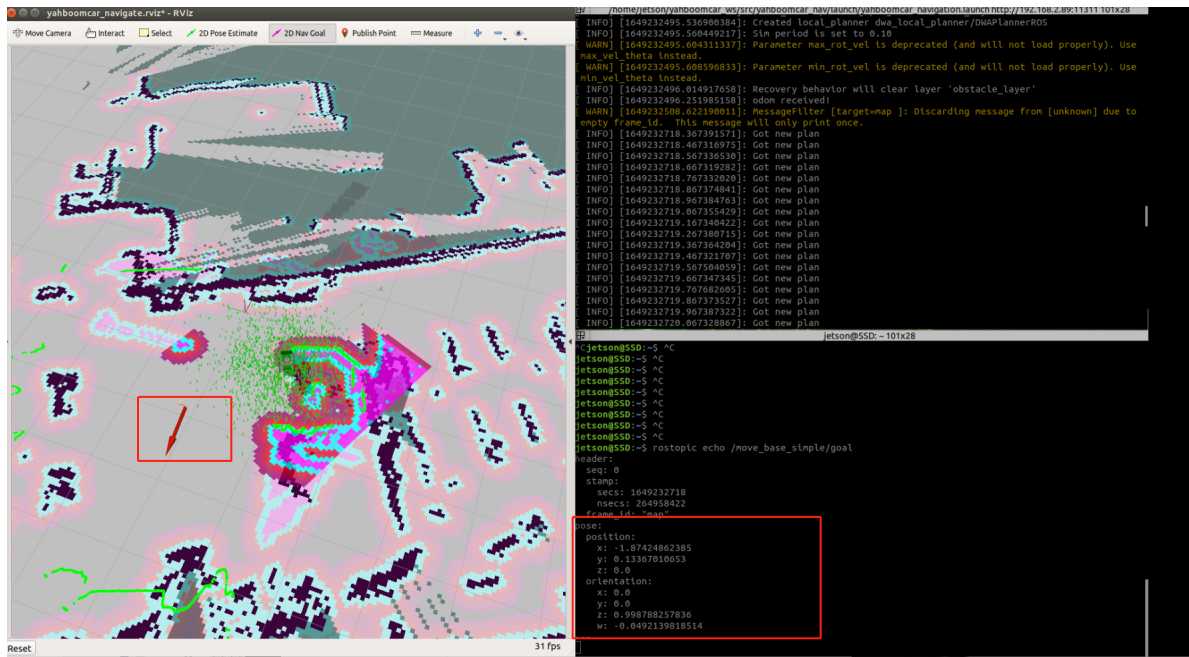
We only need to record the data for that part of the pose. Later, we need to send this part of the content manually through the program.

4. open ~/yahboomcar/src/yahboomcar_voice_ctrl/scripts/voice_Ctrl_send_mark.py, and modify the pose data just recorded to the corresponding location.

```
pose.pose.position.x = 2.15381097794
pose.pose.position.y = -5.02386903763
pose.pose.orientation.z = 0.726492681307
pose.pose.orientation.w = 0.687174202082
```

About the other two points B/C, use the same steps.

7.2.2. Voice navigation

```
roslaunch yahboomcar_nav laser_bringup.launch     #laser + yahboomcar
roslaunch yahboomcar_nav yahboomcar_navigation.launch use_rviz:=false map:=house
 # start navigation, change house to the map name of the map
python ~/yahboomcar_ws/src/yahboomcar_voice_ctrl/scripts/voice_Ctrl_send_mark.py
```

1. After calibrating the initial pose in rviz, we can say "Hi Yahboom" to wake up the voice module, until it replies "Hi, i'm here", indicating that the module has been woken up.
2. We say "Go to the point A", it will reply "OK, I'm going to the point A."

7.3. Code analysis

7.3.1. For the principle of navigation, please refer to the tutorial "11. Lidar/12. Navigation and Obstacle Avoidance". This course is mainly to judge the results of voice recognition.

Target point data,

```
        speech_r = spe.speech_read()
        if speech_r == 19 :
```

```python
        print("goal to one")
        spe.void_write(speech_r)
        pose.pose.position.x = 2.15381097794
        pose.pose.position.y =  -5.02386903763
        pose.pose.orientation.z = 0.726492681307
        pose.pose.orientation.w = 0.687174202082
        pub_goal.publish(pose)
    elif speech_r == 20 :
        print("goal to tow")
        spe.void_write(speech_r)
        pose.pose.position.x = 1.57744419575
        pose.pose.position.y = 4.8174996376
        pose.pose.orientation.z = -0.683335654604
        pose.pose.orientation.w = 0.730104364558
        pub_goal.publish(pose)

    elif speech_r == 21 :
        print("goal to three")
        spe.void_write(speech_r)
        pose.pose.position.x =  -1.08106160164
        pose.pose.position.y = 1.30198049545
        pose.pose.orientation.z =  -0.0132771070267
        pose.pose.orientation.w =  0.99991185533
        pub_goal.publish(pose)

    elif speech_r == 32 :
        print("goal to four")
        spe.void_write(speech_r)
        pose.pose.position.x =  -1.08106160164
        pose.pose.position.y = 1.30198049545
        pose.pose.orientation.z =  -0.0132771070267
        pose.pose.orientation.w =  0.99991185533
        pub_goal.publish(pose)

    elif speech_r == 33 :
        print("goal to Origin")
        spe.void_write(speech_r)
        pose.pose.position.x =  -1.08106160164
        pose.pose.position.y = 1.30198049545
        pose.pose.orientation.z =  -0.0132771070267
        pose.pose.orientation.w =  0.99991185533
        pub_goal.publish(pose)
    elif speech_r == 0 :
        pub_cmdVel.publish(Twist())S
```
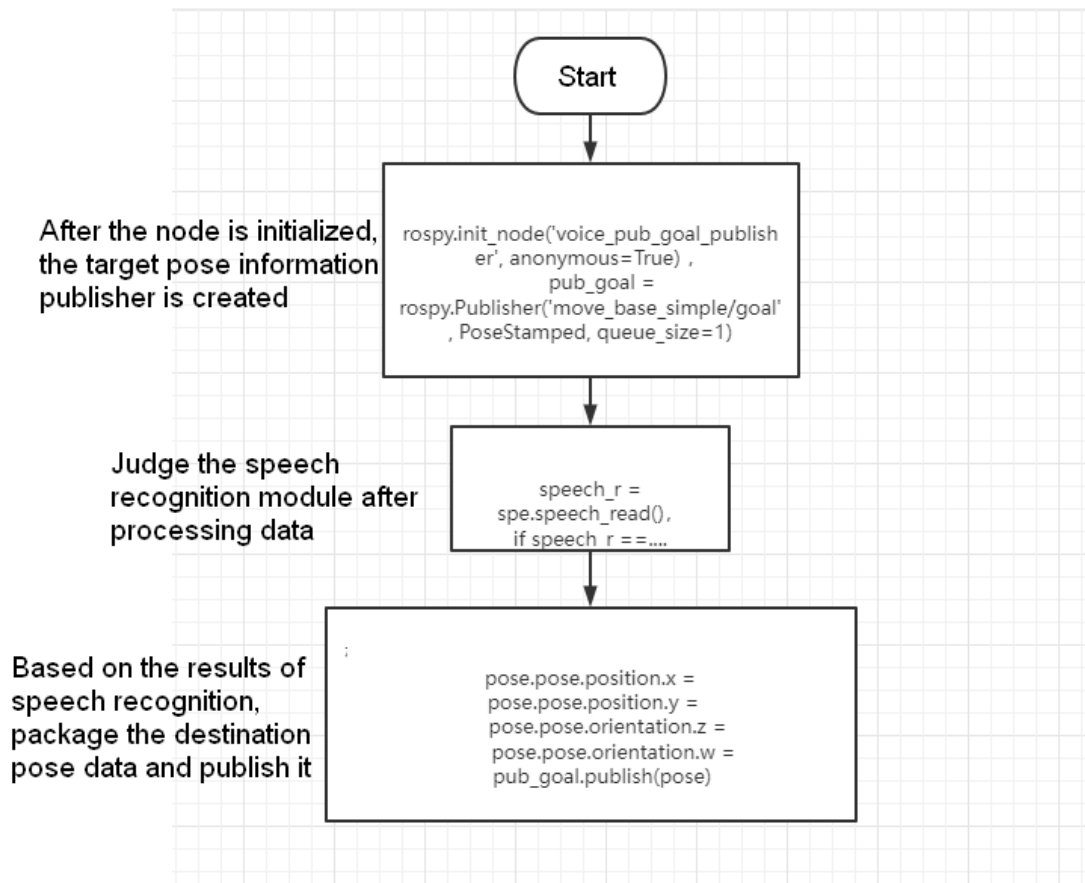
7.3.2. Flowchart

Code path:

```
~/yahboomcar/src/yahboomcar_voice_ctrl/scripts/voice_Ctrl_send_mark.py
```

7.3.3. Voice module communication protocol

function word	Speech Recognition Module Results	Voice broadcast content
Go to the point A	19	OK, I'm going to the point A.
Go to the point B	20	OK, I'm going to the point B.
Go to the point C	21	OK, I'm going to the point C.
Go to the point D	32	OK, I'm going to the point D.
Return to the original place	33	OK, I'm return back.