

## 8、APP mapping and navigation

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## 8.1、mapping

### 8.1.1、Start up

Note: When building a map, the slower the speed, the better the effect (note that if the rotation speed is slower), if the speed is too fast, the effect will be poor.

Start the drive command, this section takes 【# mono + laser + Transbot】 as an example. 【# laser + Transbot】 Cannot set the camera screen.

```
roslaunch transbot_nav usbcam_bringup.launch lidar_type:=a1 # mono + laser + Transbot
roslaunch transbot_nav astra_bringup.launch # Astra + Transbot
roslaunch transbot_nav laser_bringup.launch lidar_type:=a1 # laser + Transbot
roslaunch transbot_nav transbot_bringup.launch lidar_type:=a1 # Astra + laser + Transbot
```

Start the mapping function

```
roslaunch transbot_nav transbot_map.launch map_type:=gmapping
```

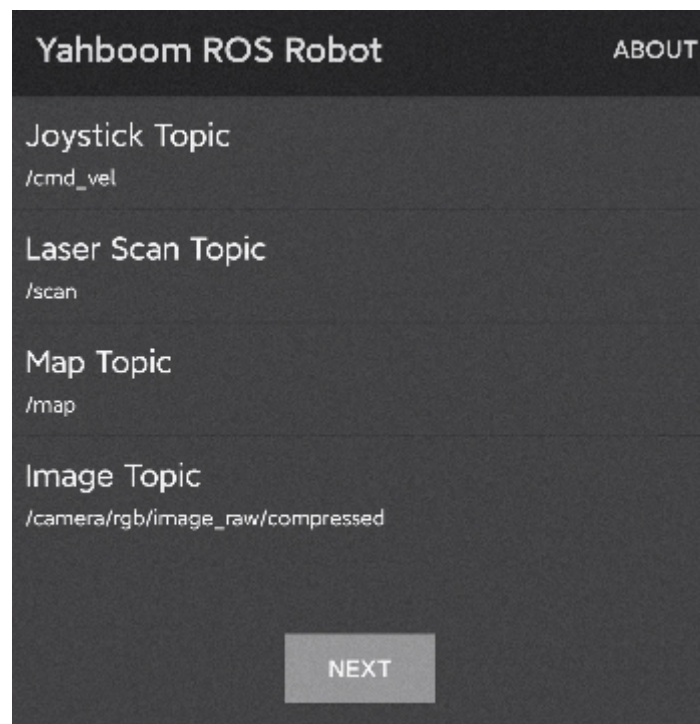
### 8.1.2、Usage

After the jetson nano terminal is started, click APP

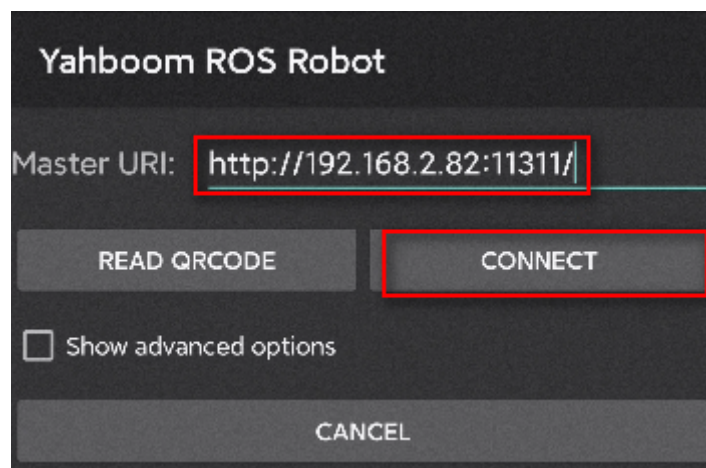


Modify the corresponding topic name.

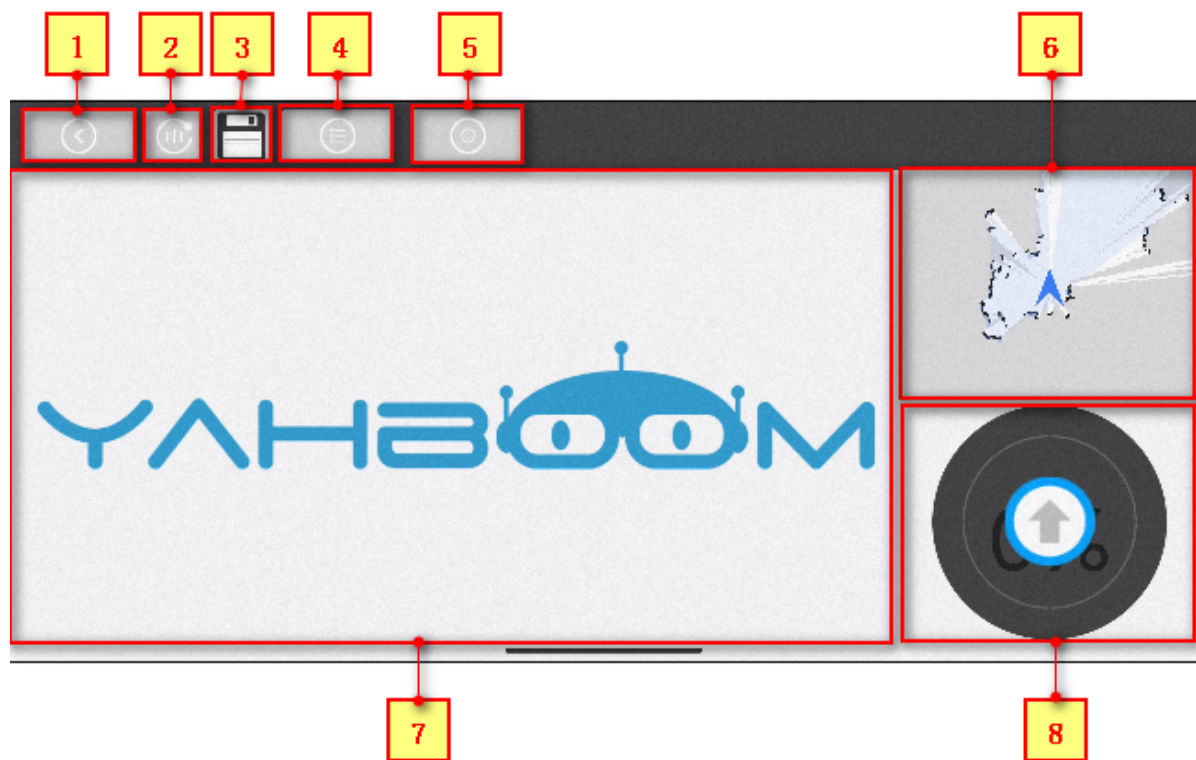
You can also enter the map creation function without modifying it at this time. Please do not modify during the demonstration.



To ensure that the mobile phone and the robot are on the same network, enter the robot 【IP】 in the 【Master URI】 , and click 【CONNECT】 to log in.



Enter the mapping interface



- 1: Return to the previous step
- 2: Refresh the map
- 3: Save the map
- 4: Navigation function
- 5: Settings
- 6: Map building area
- 7: Camera screen display area
- 8: Rocker

Click the area 【6】 to switch with the area 【7】 interface. Since there is no subscription topic for the image, only the YAHBOOM logo is displayed.

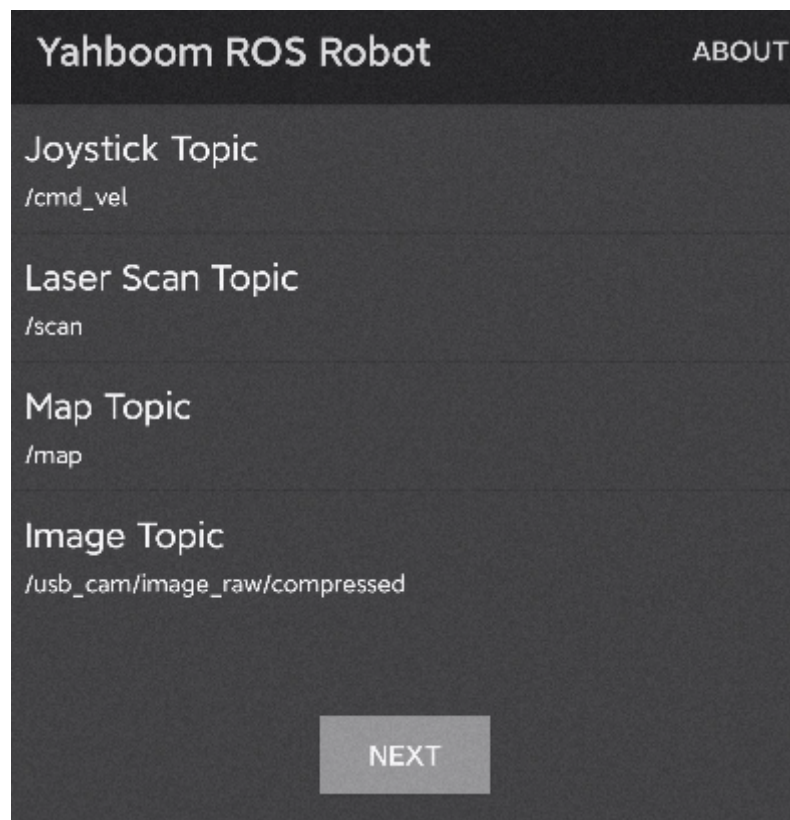
View image topics

```
rostopic list
```

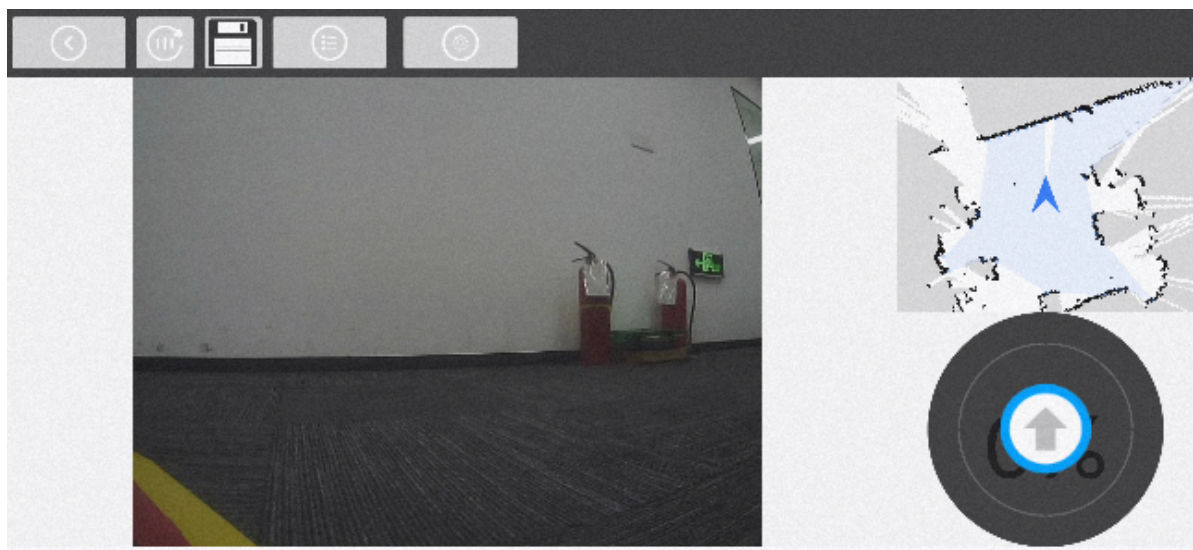
```
/usb_cam/camera_info
/usb_cam/image_raw
/usb_cam/image_raw/compressed
/usb_cam/image_raw/compressed/parameter_descriptions
/usb_cam/image_raw/compressed/parameter_updates
/usb_cam/image_raw/compressedDepth
/usb_cam/image_raw/compressedDepth/parameter_descriptions
/usb_cam/image_raw/compressedDepth/parameter_updates
/usb_cam/image_raw/theora
/usb_cam/image_raw/theora/parameter_descriptions
/usb_cam/image_raw/theora/parameter_updates
```

We can click 【1】 or 【5】 to set the subscription topic of the image. Modified to 【/usb\_cam/image\_raw/compressed】 , it must be a compressed image.

Click "NEXT".



At this point, there is an image in the interface.



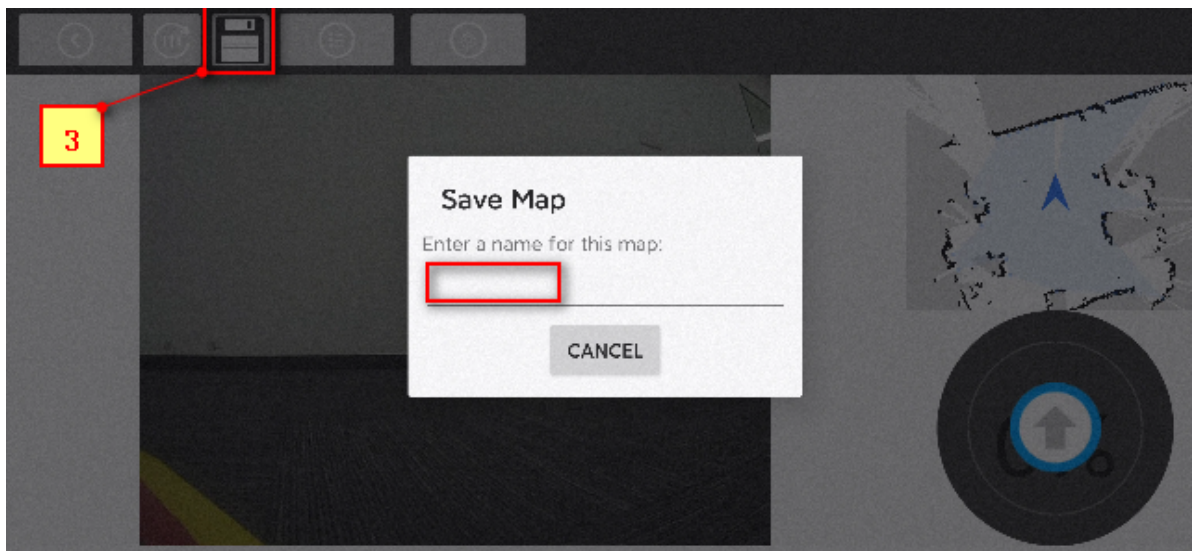
Slide the joystick in part 【8】 control robot.

When you slide the joystick, the slower the speed, the better the effect (especially the rotation speed), and control the robot to move until the map is created.

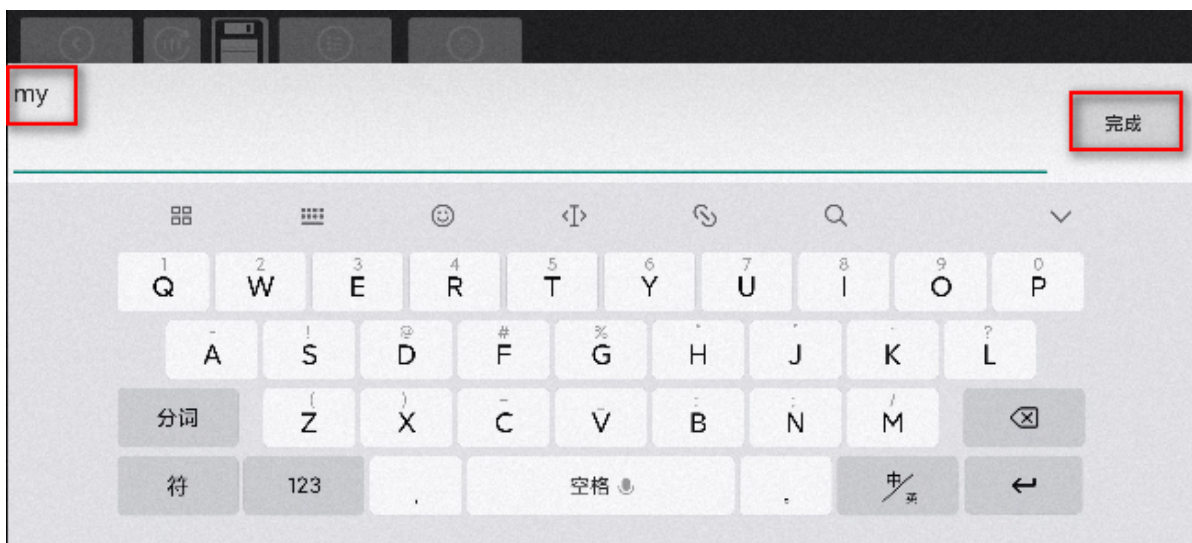
### 8.1.3、 Save map

After the map is created, click 【3】 to save the map.

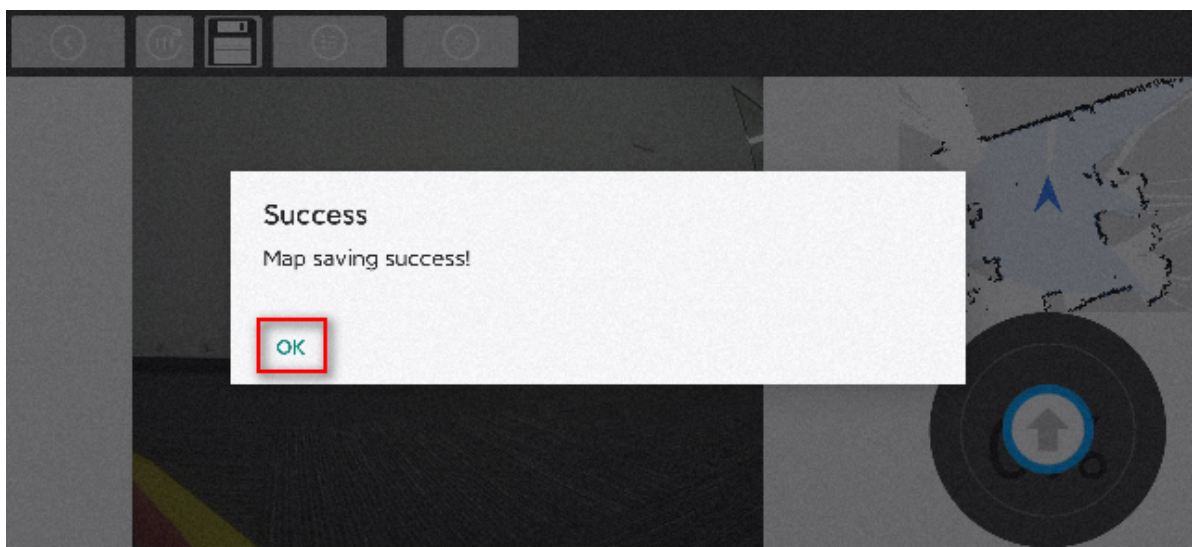




Click above the horizontal line, enter the name of the saved map 【my】 , and click 【Finish】 (only in English, no symbols).



The APP interface will pop up the map save successfully dialog box, click 【OK】 .



## 8.2、 Navigation obstacle avoidance

**Note: [R2] on the handle can cancel the target point!!!**

**Do not use rocker control during navigation!!!**

### 8.2.1、 Start up (jetson nano)

Start the drive and start it according to demand.

This section takes [# mono + laser + Transbot] as an example.

【# laser + Transbot】 Cannot set the camera screen.

```
roslaunch transbot_nav usbcam_bringup.launch lidar_type:=a1 # mono + laser + Transbot
roslaunch transbot_nav astra_bringup.launch # Astra + Transbot
roslaunch transbot_nav laser_bringup.launch lidar_type:=a1 # laser + Transbot
roslaunch transbot_nav transbot_bringup.launch lidar_type:=a1 # Astra + laser + Transbot
```

Start navigation obstacle avoidance function

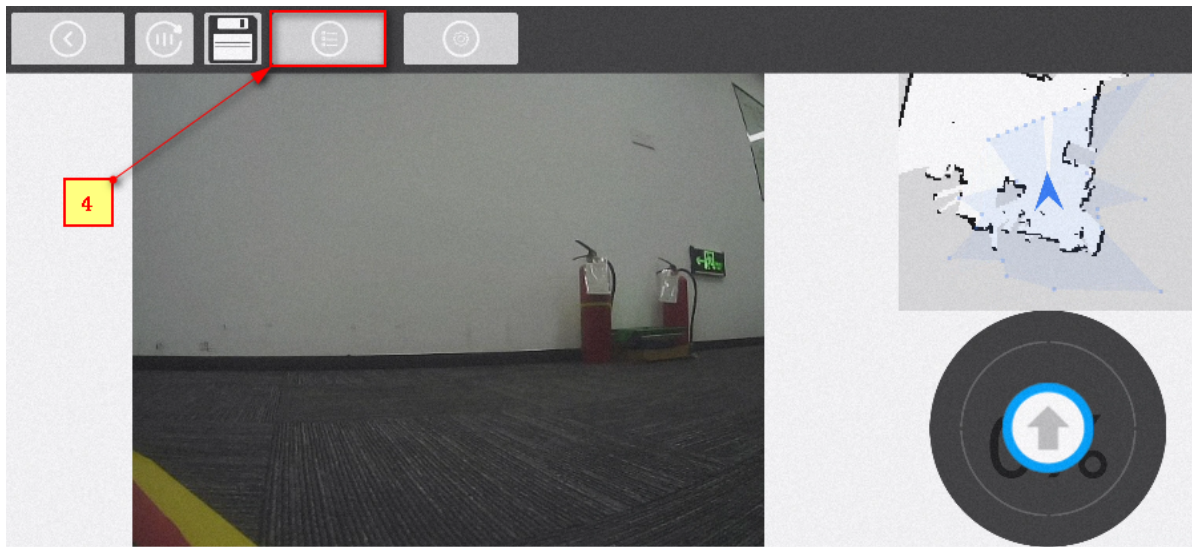
```
roslaunch transbot_nav transbot_navigation.launch map:=my
```

- Parameter [map]: Load the specified map file, the name is [my].

### 8.2.2、 Usage

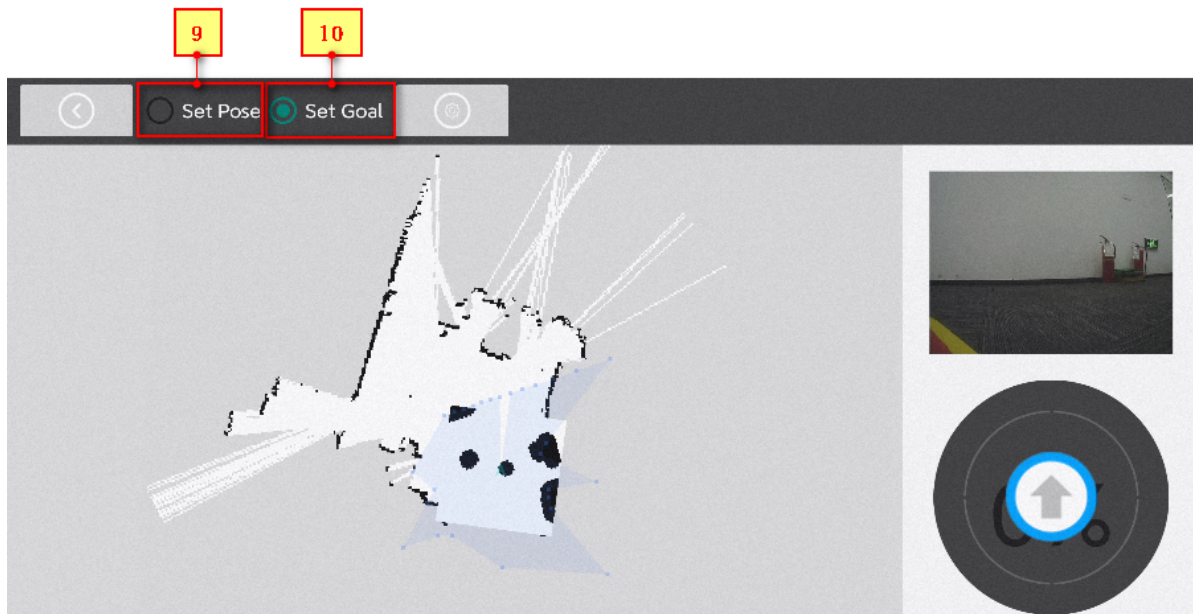
After logging in, directly enter the mapping interface.

At this time, you need to click 【4】 on APP to enter the navigation interface and switch the screen.



Enter the navigation interface. As shown below.





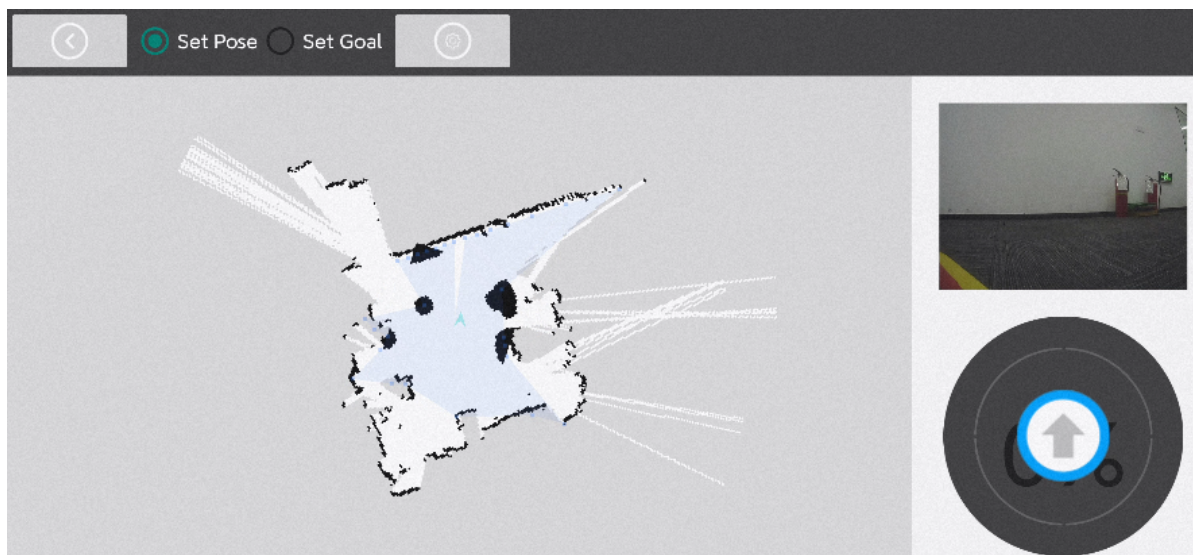
- 9: Set the initial pose of the robot
- 10: Set the target pose

It can be seen from the above figure that the robot is not placed at the origin when the map was created, so the scanned point does not coincide with the map.

So we need to set the initial pose of the robot to ensure that the position of the tracked vehicle in the real scene coincides with the position of the robot in the simulation on the map.

First click **【9】**, select the approximate position of the robot on the map, don't let go, continue sliding to the approximate posture of the robot.

Make the scanned points coincide with the map as much as possible.



Click **【10】** on APP, select the target position of the robot on the map, don't release, continue to slide to the posture that the robot wants to maintain.

After releasing, the robot will move to the target pose.

