13. APP mapping and navigation

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13.1 Mapping

13.1.1 Start

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

According to different models, you only need to set the purchased model in [.bashrc], X1(ordinary four-wheel drive) X3(Mike wheel) X3plus(Mike wheel mechanical arm) R2(Ackerman differential) and so on. Section takes X3 as an example

Open the [.bashrc] file

```
sudo vim .bashrc
```

Find the [ROBOT_TYPE] parameter and modify the corresponding model

```
export  ROBOT_TYPE=X3    # ROBOT_TYPE: X1 X3 X3plus R2 X7
```

Start the driver command(robot side), for the convenience of operation, this section takes [mono + laser + Transbot] as an example. 【laser + Transbot】Cannot set the camera screen.

```
roslaunch  yahboomcar_nav  laser_bringup.launch            # laser + yahboomcar
roslaunch  yahboomcar_nav  laser_usb_bringup.launch        # mono + laser +
yahboomcar
roslaunch  yahboomcar_nav  laser_astrapro_bringup.launch   # Astra + laser +
yahboomcar
```

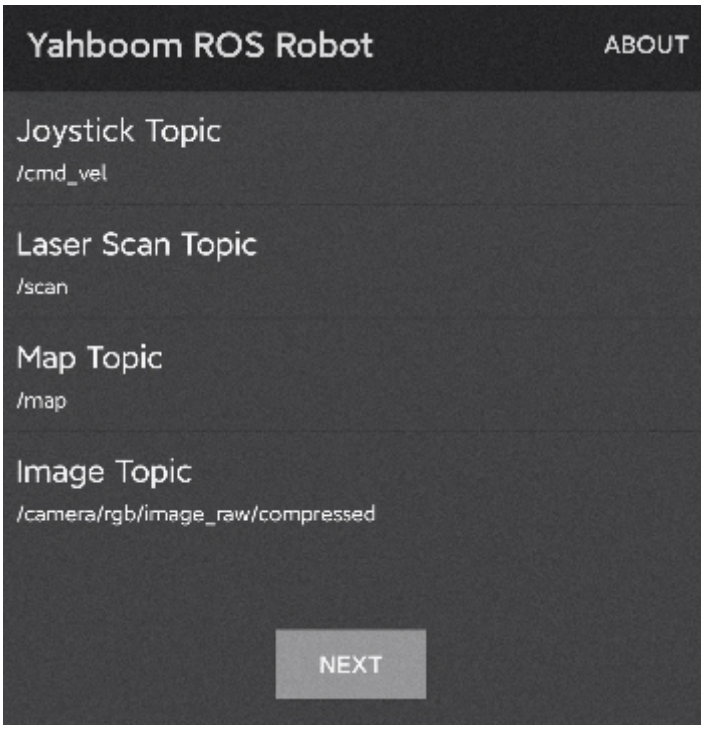
Start the mapping function(robot side)

```
roslaunch  yahboomcar_nav  yahboomcar_map.launch  use_rviz:=false
map_type:=gmapping
```

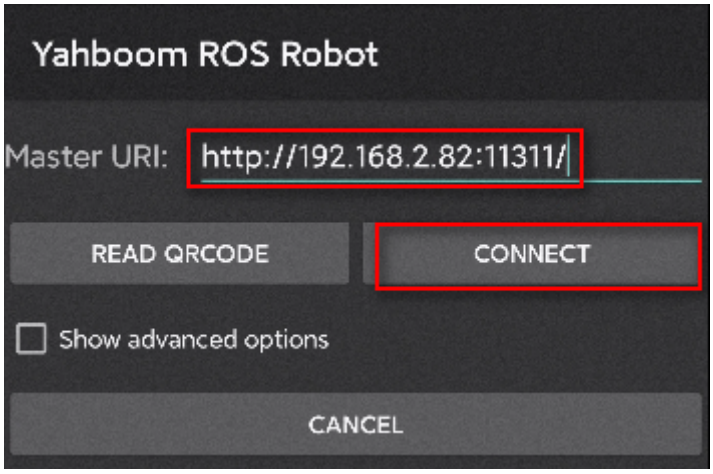
13.1.2 Use

After the robot is started, click APP

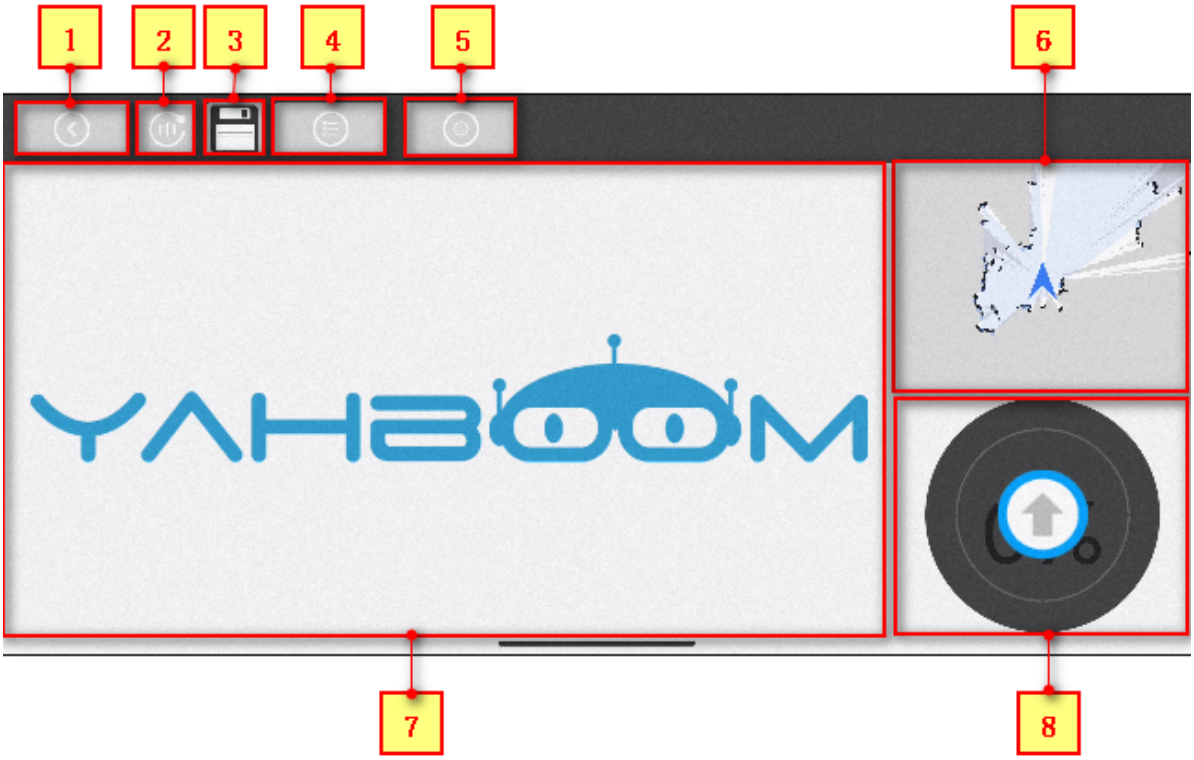
Modify the corresponding topic name. You can enter the map building function and then modify it without modifying it at this time. Do not modify it during the demo.



To ensure that the phone and the robot are on the same network, enter the robot's IP in the [Master URI], and click [CONNECT] to log in.



Enter the drawing interface



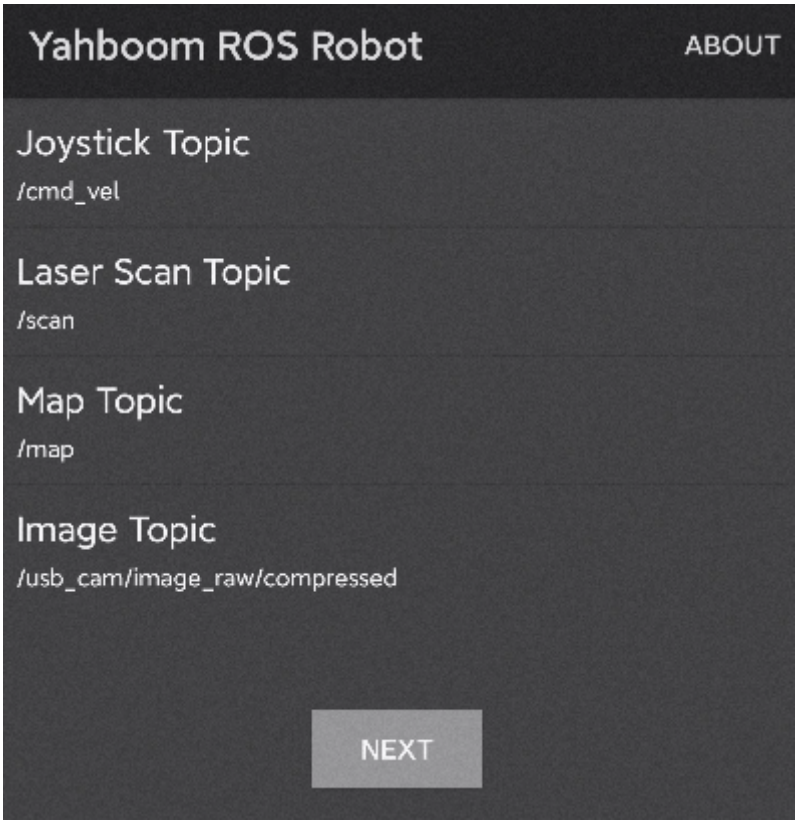
- 1: Back to the previous step
- 2: Refresh the map
- 3: Save the map
- 4: Navigation function
- 5: Settings
- 6: Mapping area
- 7: Camera screen display area
- 8: rocker

Click the area [6] to switch with the area [7] interface. Since there is no subscription topic for the image, only the logo of YAHBOOM is displayed. View Image Topics

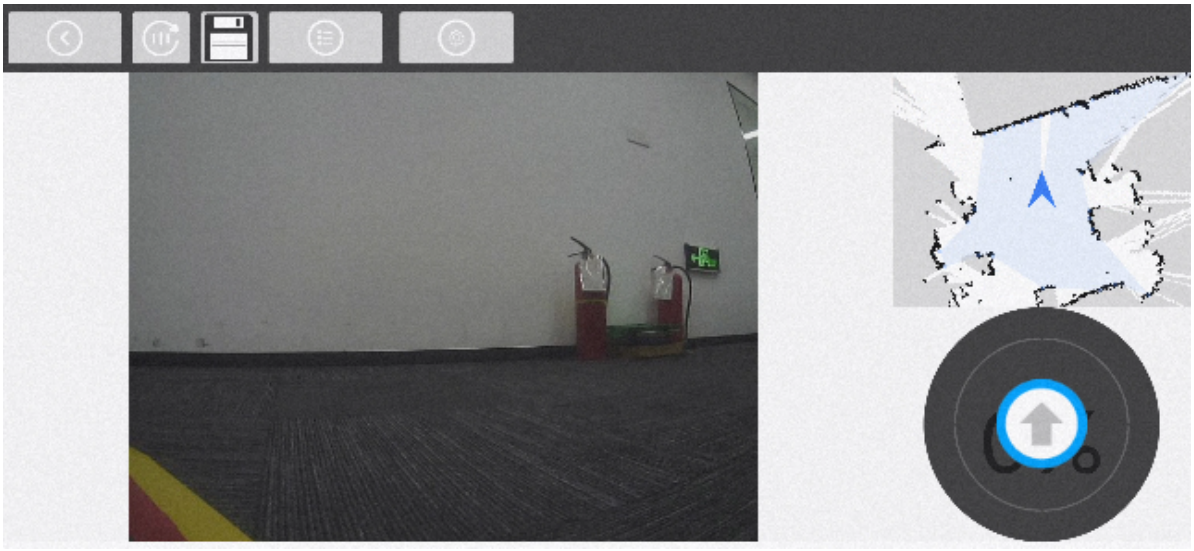
```
rostopic list
```

```
/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
```

At this point, we can click [1] or [5] to set the subscription topic of the image. Modify it to [/usb_cam/image_raw/compressed], which must be a compressed image. Click Next



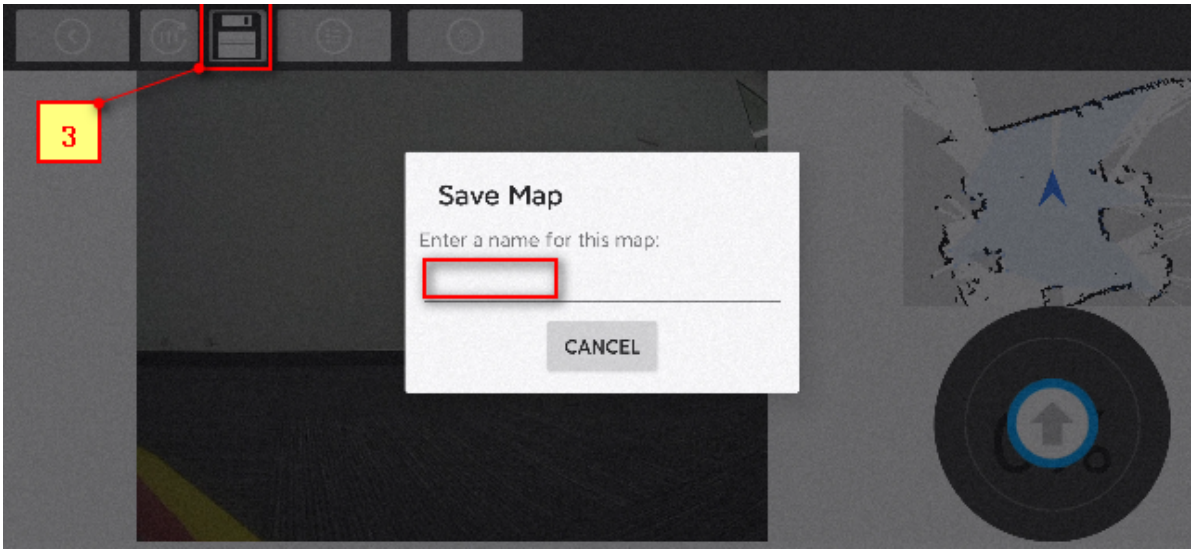
At this point, there is an image in the interface



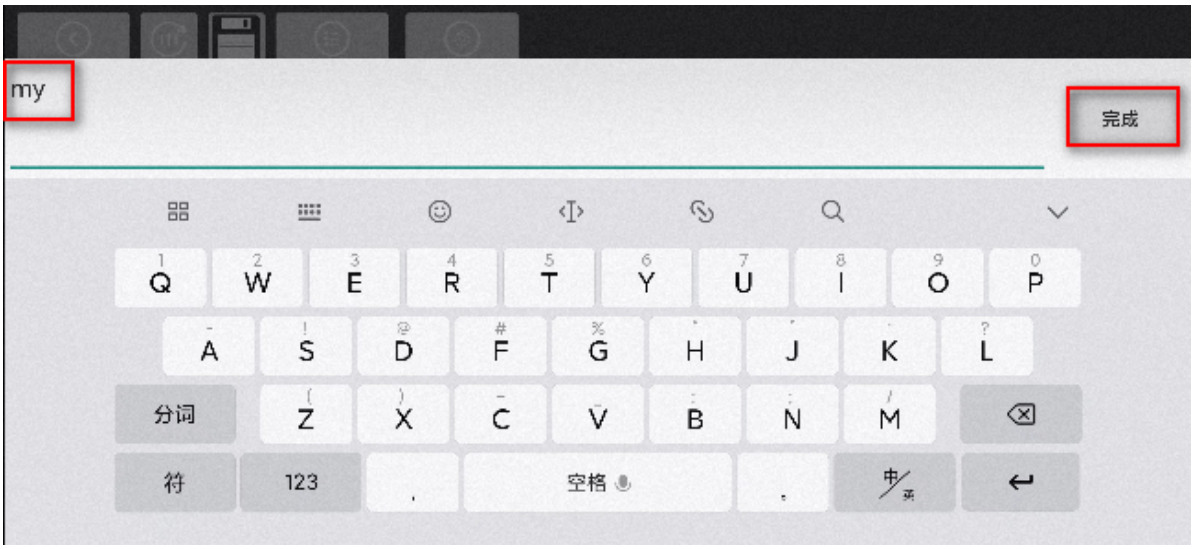
At this time, slide the joystick in part [8]. When sliding the joystick, the slower the speed, the better the effect(especially the rotation speed), and control the robot to move until the map is created.

13.1.3 Map save

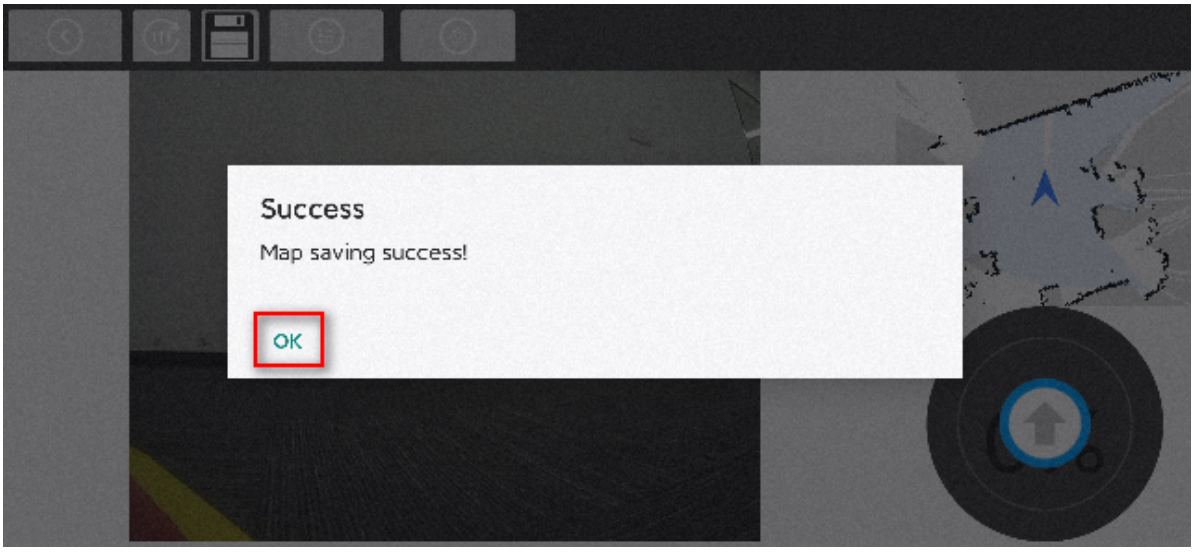
After the map is created, click [3] to save the map



Click above the horizontal line, enter the name of the saved map [my], and click Finish.



The map save successfully dialog box pops up, click [OK] to complete.



13.2 Navigation and obstacle avoidance

Note: [R2] of the remote control handle has the function of canceling the navigation target point! ! !When navigating [whole process] do not use the joystick control! ! !

13.2.1 Start

Start the driver command(robot side), for the convenience of operation, this section takes [mono + laser + Transbot] as an example. 【laser + Transbot】Cannot set the camera screen.

```
roslaunch  yahboomcar_nav  laser_bringup.launch            # laser + yahboomcar
roslaunch  yahboomcar_nav  laser_usb_bringup.launch        # mono + laser +
yahboomcar
roslaunch  yahboomcar_nav  laser_astrapro_bringup.launch   # Astra + laser +
yahboomcar
```

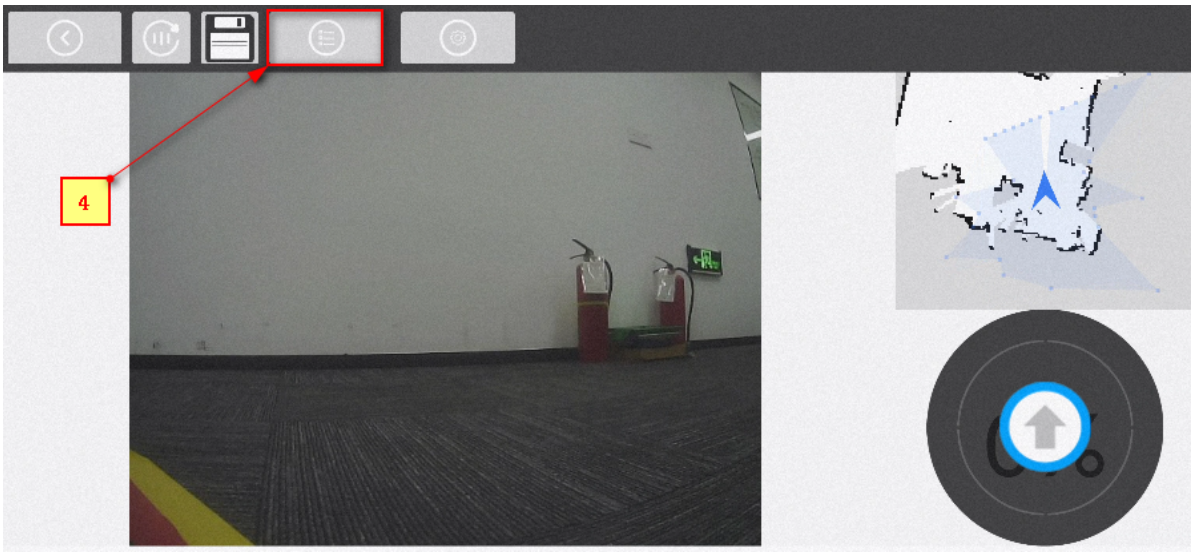
Start the navigation obstacle avoidance function(robot side)

```
roslaunch  yahboomcar_nav  yahboomcar_navigation.launch  use_rviz:=false  map:=my
```

- use_rviz parameter: whether to open rviz.
- map: map name, load the map file named [my].

13.2.2 Use

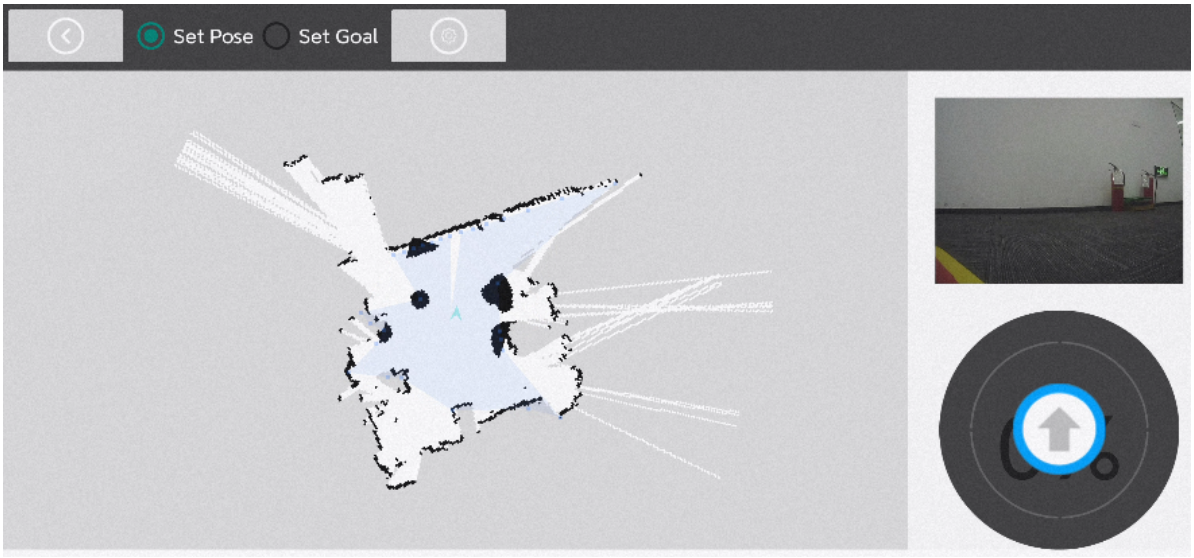
The login method is the same as the above. After logging in, you will directly enter the mapping interface. At this time, you need to click [4] to enter the navigation interface and switch the screen.



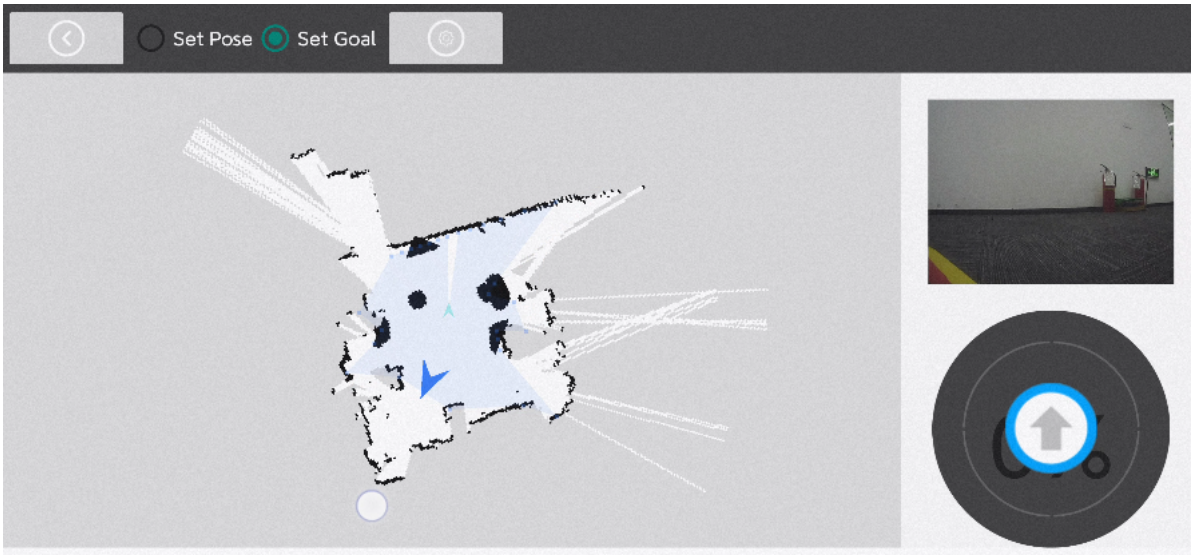
Enter the navigation interface

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

As you can see in the above figure, the robot is at the origin when building the map, but we did not place the robot at the origin, so the scanned points do not coincide with the map. At this time, we need to set the initial pose of the robot, first click [9], select the approximate position of the robot in the map, do not let go, and continue to slide towards the approximate pose of the robot. Make the scanned points coincide with the map as much as possible.



Click [10], select the target position of the robot on the map, do not let go, continue to slide to the posture that the robot wants to maintain, after releasing, the robot will drive to the target posture.


Set Pose
Set Goal