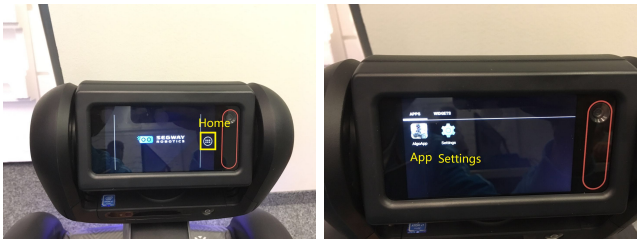
Model Deployment Instruction

Once you have a trained detection model, you can now deploy it to Loomo, a Segway robot, for the object following task. To ease deployment, you are provided with a communication protocol between a robot and a cloud computer, *e.g.*, your laptop or a GPU workstation. With this protocol, you can run a trained detector on the cloud computer which receives image streams from and returns results to the robot.

1 Robot

1.1 Turn on your robot

To turn on a Loomo, press the button on its body and the button on its head in turn. Figure 1 shows the main pages after you turn on the robot.

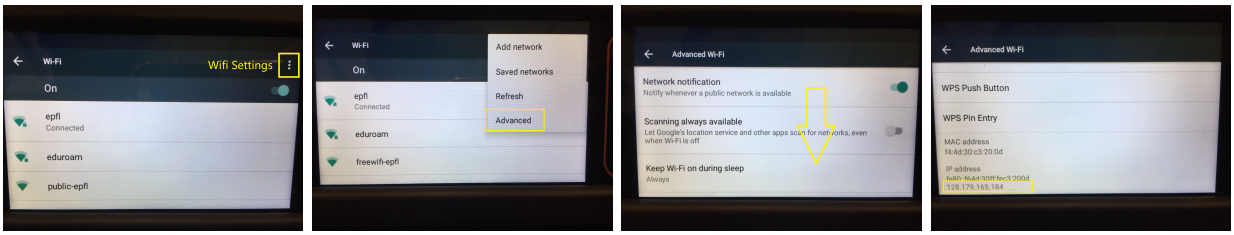


(a) Home **(b)** Apps

Figure 1: Turn on robots

1.2 Find dynamic IP address

To establish the communication between the robot and your pc via Wi-Fi, you need to find the IP address, as shown in Figure 2.

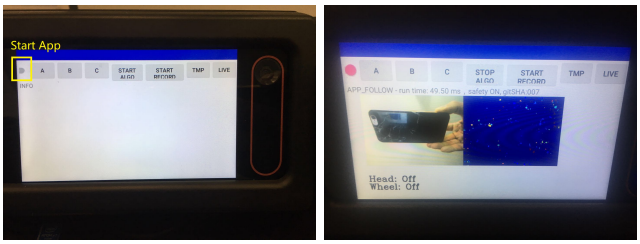


(a) Step 1 **(b)** Step 2 **(c)** Step 3 **(d)** Step 4

Figure 2: Find IP address

1.3 Start robot app

You can now get back to the main page by tapping the robot's ear. Figure 3 shows how to start the robot app for object detection.



(a) Before Start **(b)** After Start

Figure 3: Start App

1.4 Turn on controllers

Once the app is initialized, you can switch on the controller of the robot's head and wheel with the button

- A: head control
- B: wheel control

2 Cloud

Once the robot is settled, you can now start your model on the cloud.

1. Test the IP address and the video stream

   ```
   python test.py --ip-address <robot ip>
   ```

2. Run your model

   ```
   python client.py --ip-address <robot ip> --checkpoint <location of
   ↪  trained model>
   ```

3 Tuning (optional)

To improve the performance of your tracking robot, you may want to fine-tune the resolution of your image stream as well as the parameters of your controllers. One way to change these parameters is to push a configuration file into the robot.

1. Connect to robots through wifi

   ```
   add connect <robot ip>
   ```

2. Push configuration file

   ```
   adb push follow.cfg /sdcard/
   ```

The default parameters are as follows:

```
1.50    % k_p, head controller
0.10    % k_i, head controller
0.01    % k_d, head controller
0.50    % k_p, vehicle controller
0.01    % k_i, vehicle controller
0.01    % k_d, vehicle controller
8.00    % image downscale rate, the original image is 640 x 480
```