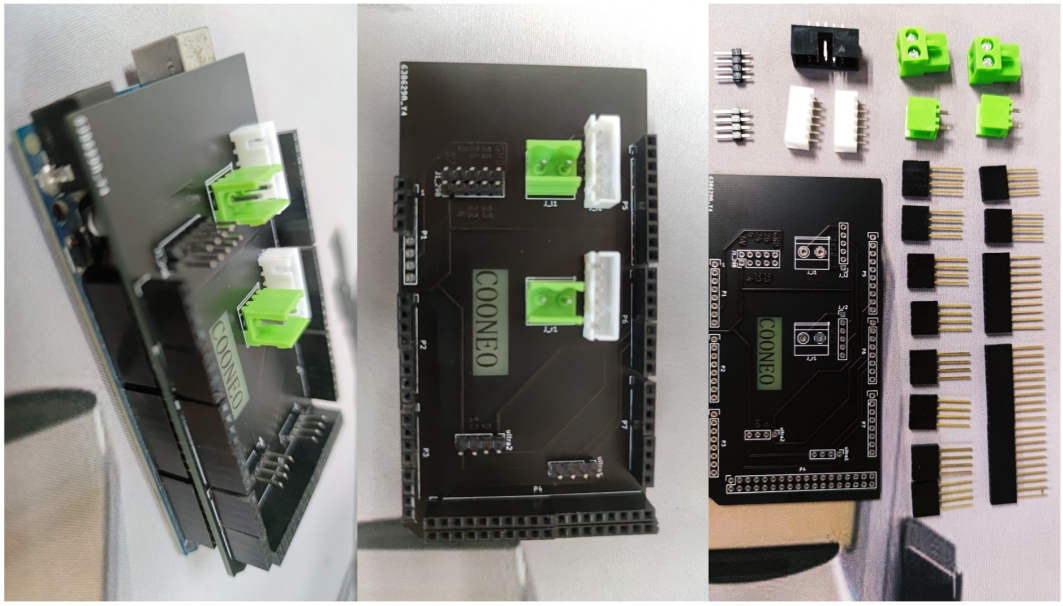
Arduino_Raspberry_ROS_Car Tutorials

chapter 1: Construction A ROS Car

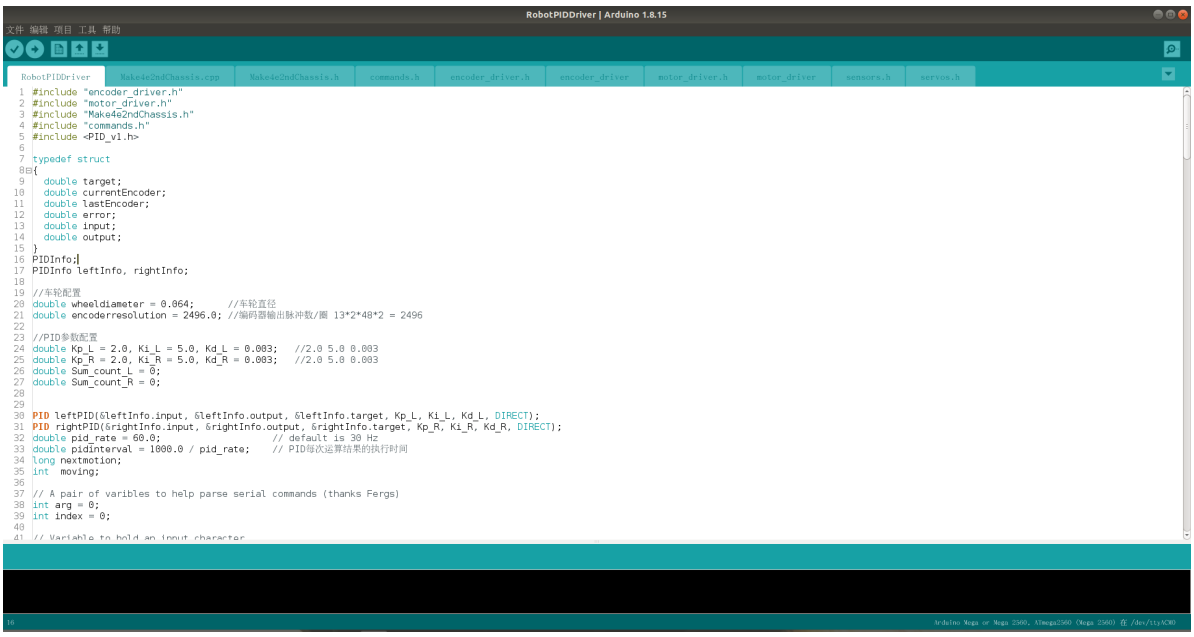


Download codes from Git:

```
git clone https://github.com/COONEO/Arduino_Raspberry_ROS_Car.git
```

Step One: Download programs for Arduino Mega 2560

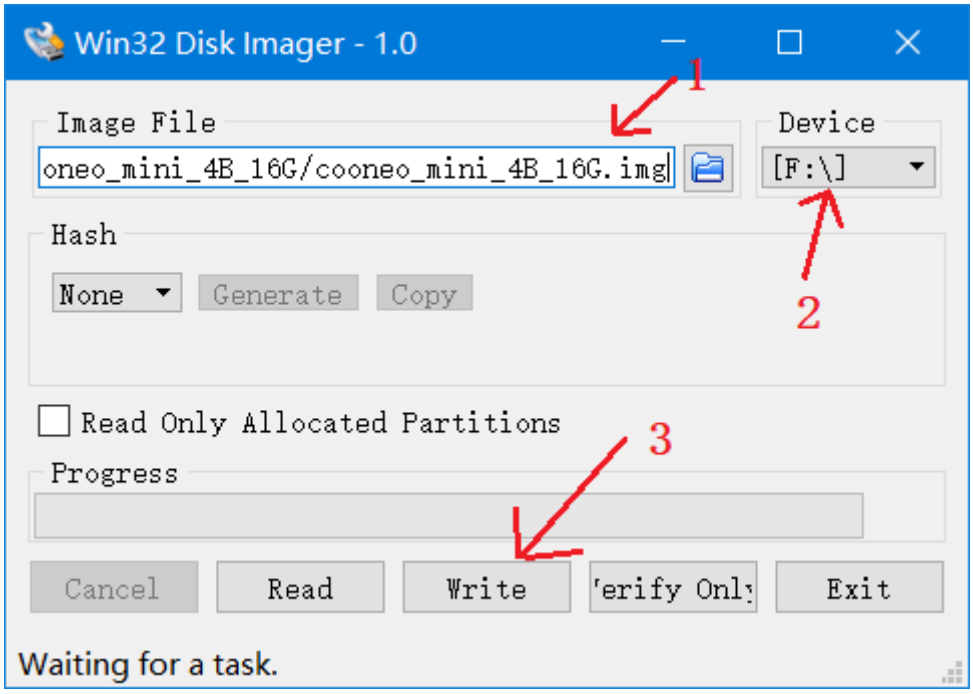
Install Arduino IDE in your computer and add library where in Arduino_mega_2560_code/relative_library folder.than,download the code into your Arduino_mega_2560 board.



Step Two: FLASH OS and LAUNCH ROS NODE

1.flash Ubuntu OS into your Pi 4B board (By Win32DiskImager.exe)

The OS img can be finding in our **Wechat Official Account COONEO.** Process like this:



2. launch ROS node in Raspberry Pi

```
#connect Raspberry Pi and Arduino
sudo chmod 0777 /dev/ttyACM0
```

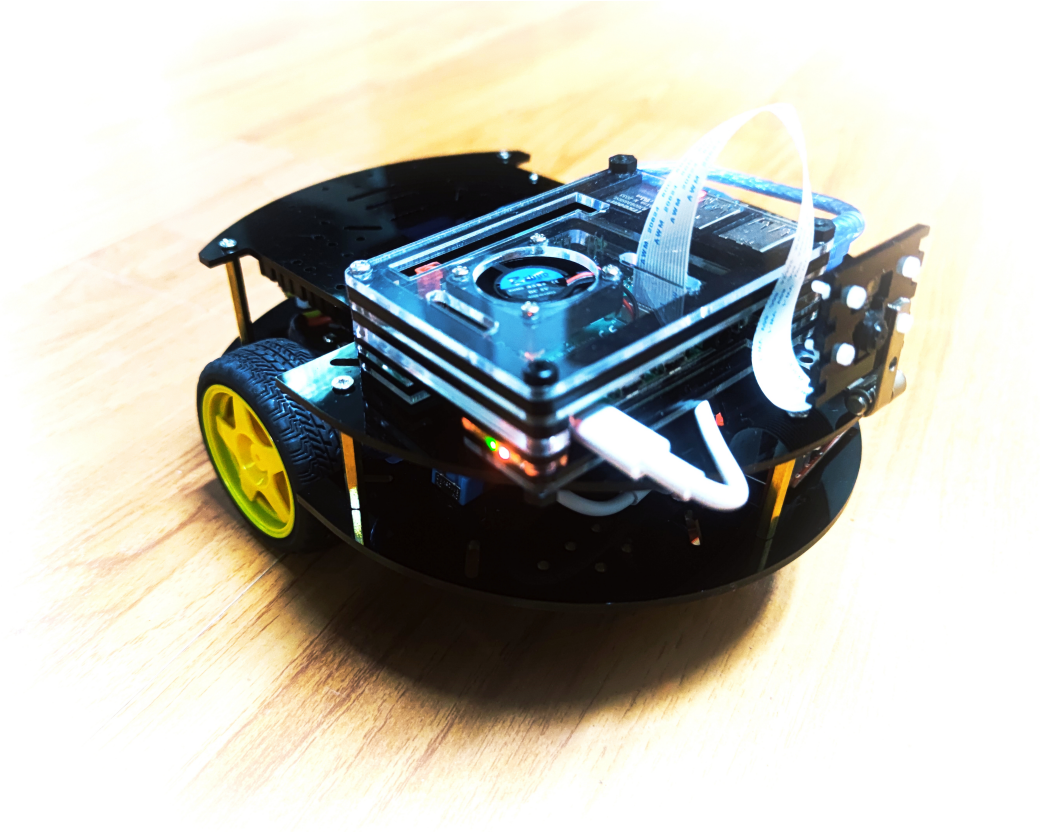
```
#open a Terminal &&  download codes
git clone https://github.com/COONEO/Arduino_Raspberry_ROS_Car.git

# copy ROS node in your home folder
cp -r Arduino_Raspberry_ROS_car/Raspberry_Pi_ROS_Node/catkin_ws ~/

# change *.py file's permission
sudo chmod 0777
Arduino_Raspberry_ROS_car/Raspberry_Pi_ROS_Node/catkin_ws/src/ros_arduino_bridge/ros_arduino_python/src/ros_arduino_python/*
sudo chmod 0777
Arduino_Raspberry_ROS_car/Raspberry_Pi_ROS_Node/catkin_ws/src/ros_arduino_bridge/ros_arduino_python/nodes/arduino_node.py

cd catkin_ws
catkin_make
source devel/setup.bash
roslaunch ros_arduino_python arduino.launch
```

In the end,you can publish Topic "cmd_vel" msg to control ROS car runnning。

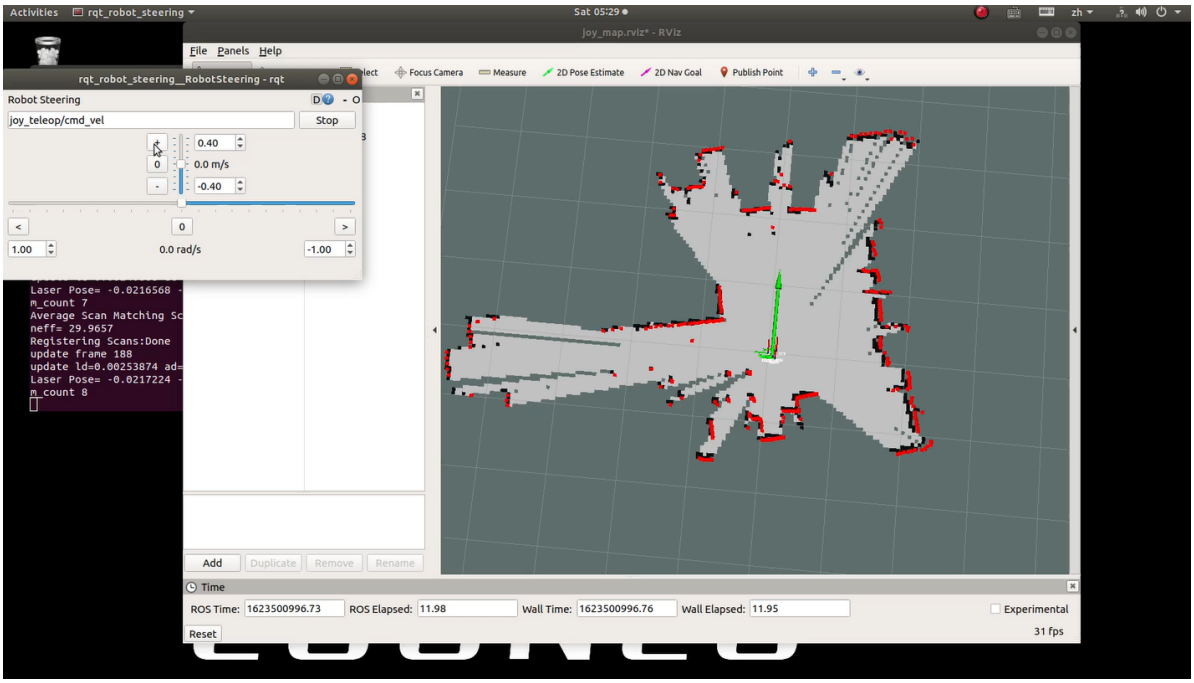


chapter 2: Gmapping with Arduino_Raspnerry_Car

Step 1 : launch gmapping launch file and watching.

```
# open a Terminal
cd catkin_ws
source devel/setup.bash
roslaunch launch_file gmapping_ekf.launch

# open a Rviz && Visual a map
rosrun rviz rviz
```



Step 2 : save the map

```
# open a Terminal
# cd in your folder,P.S.
cd catkin_ws/src/launch_file/map/
rosrun map_server map_saver -f your_map_name
```

and then,the folder will create two files,they are **your_map_name.pgm** && **your_map_name.yaml** file.

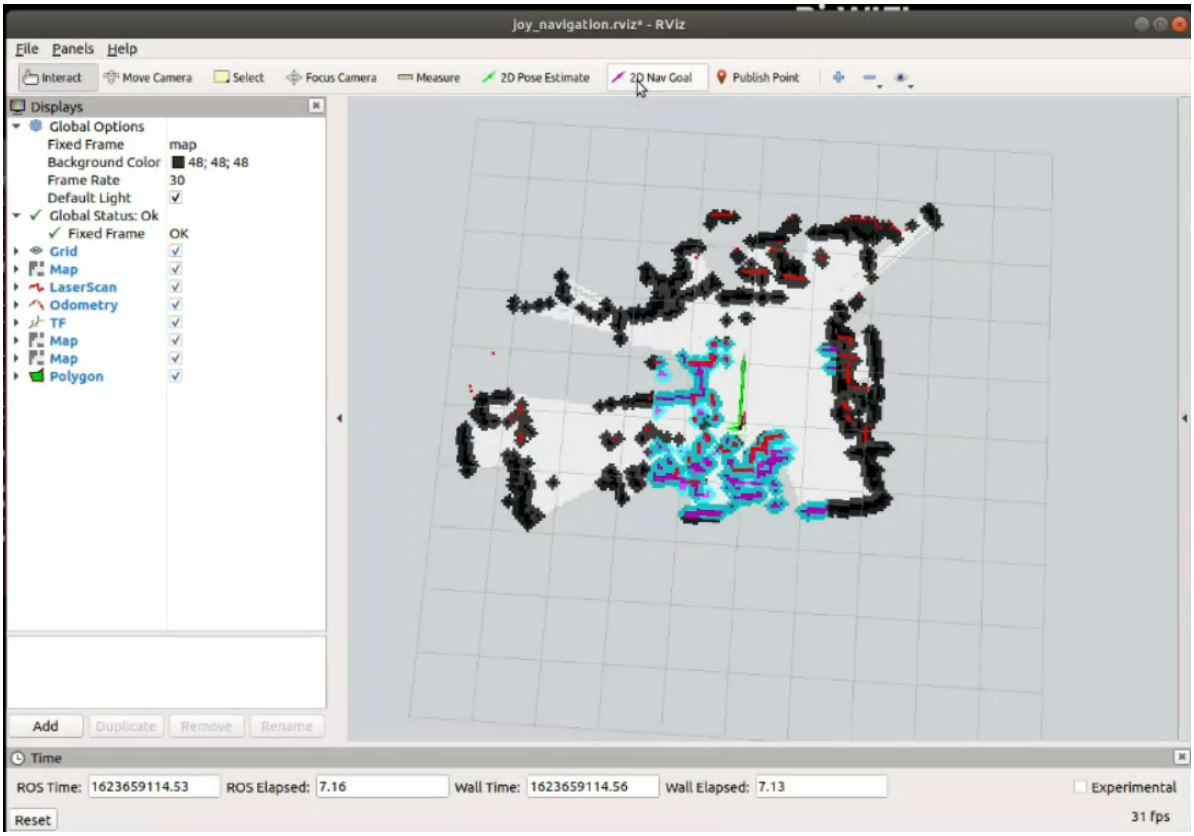
chapter 3 : Run ROS navigation stack

Step 1 : launch navigation_ekf.launch file.

```
# open a Terminal
cd catkin_ws
source devel/setup.bash
roslaunch launch_file navigation_ekf.launch

# and open another Terminal
rosrun rviz rviz
```

select topics like this in Rviz.

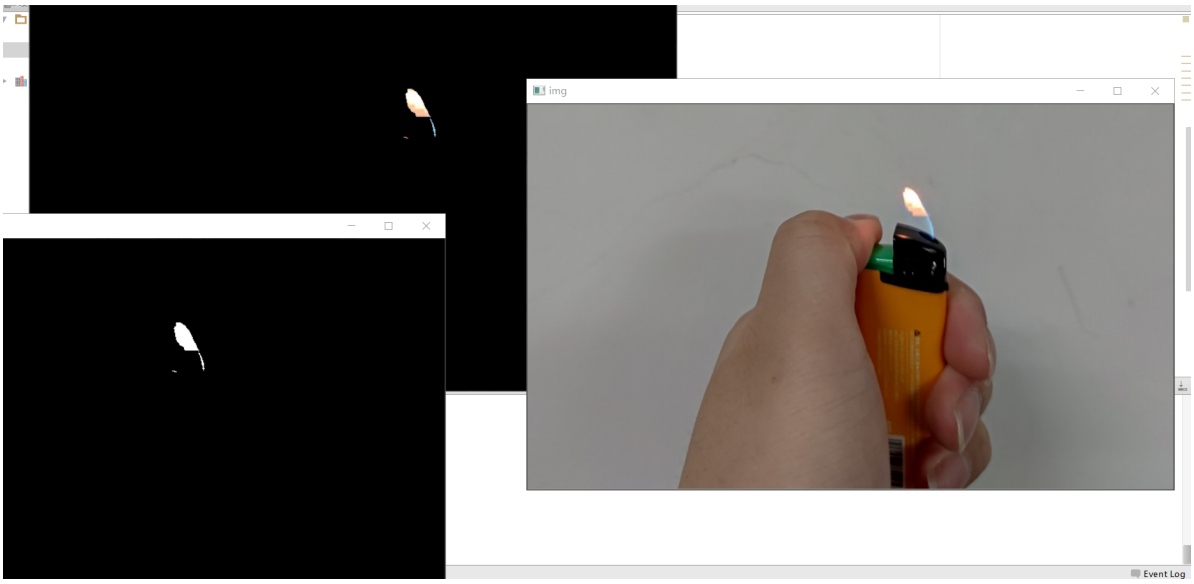


and then,click the "2D Nav Goal" button to select a Goal pose.for details,please see the "demo_videos/03_ROS_Navigation_function.mp4" file.

Chapter 4 : Fire detect

```
# open a Terminal
cd catkin_ws
source devel/setup.bash
fire_detect_cpp.launch  #or "fire_detect.launch"

# and open another Terminal
rosrun rviz rviz
```



for more details,please see the "demo_videos/04_Fire_detect_based_on_color.mp4" file. or search the "COONEO" in your Bilibili.

chapter 5 : automatic following the line

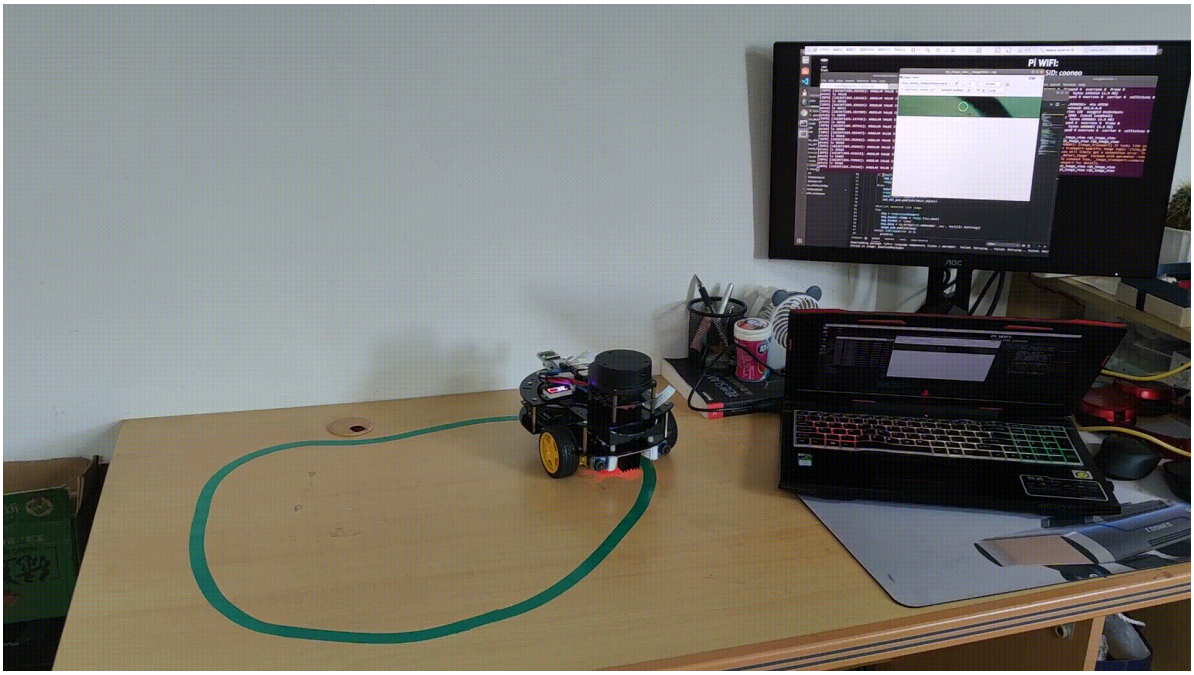
Step 1 : launch the ros_arduino_bridge node.

```
# open a terminal
cd catkin_ws
source devel/setup.bash

roslaunch ros_arduino_python arduino.launch
```

Step 2 : launch the line_track launch file.

```
# open another terminal
cd catkin_ws
source devel/setup.bash
roslaunch line_track linetrack_red.launch
```



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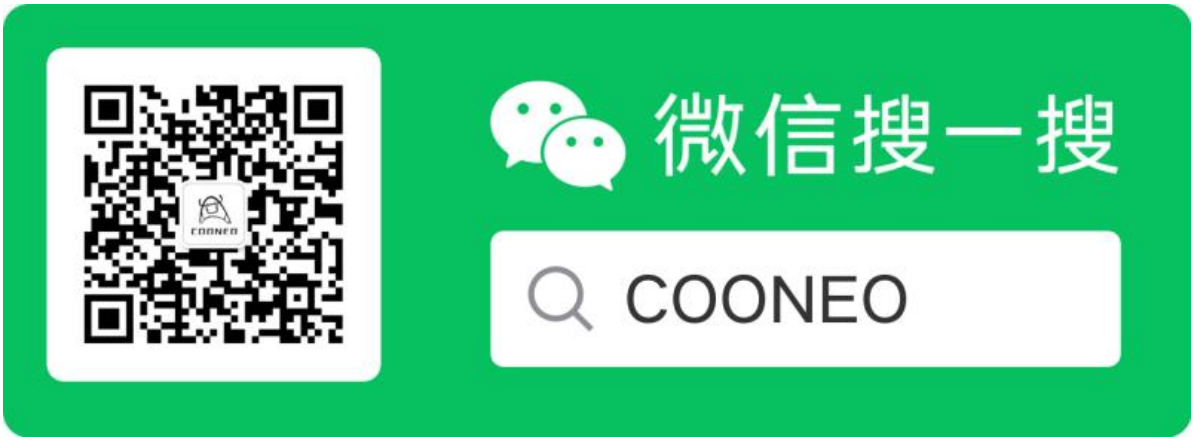
author:ZhaoXiang Lee

COONEO Co.,Ltd

Web:http://cooneo.cc

E: cooneo@outlook.com

For more details,you can search "COONEO" in your WeChat.



or search "COONEO" in Bilibili.