6、follow machine code

6.1、Experiment Description

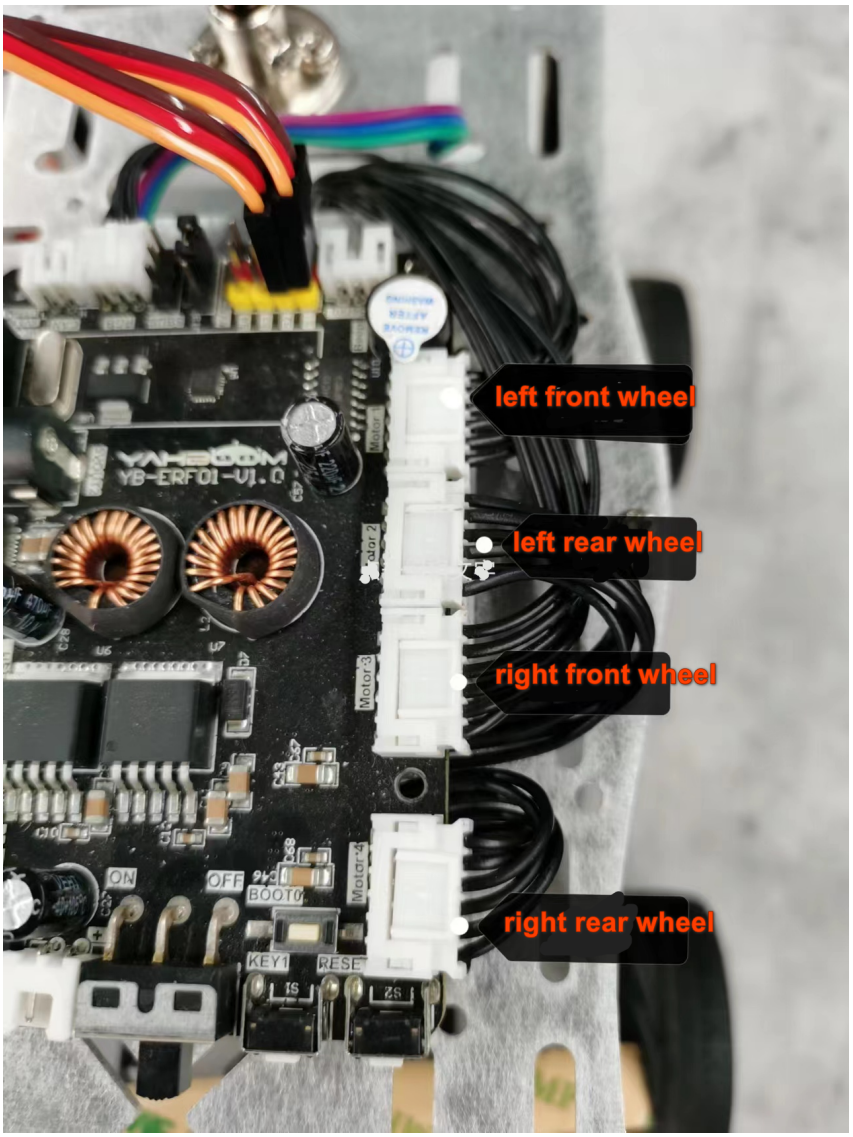
Note: This experiment is an expansion experiment and needs to be used with other external devices. The car chassis and ROS expansion board used here are not part of the K210 development board kit, so the effect of this experiment is for reference only. If there is no corresponding device, it cannot be used. Use this example code directly.

The ROS expansion board needs to flash the firmware in advance: ROS-CAR.hex

Since the voltage of the motor used this time is 8.4V, the battery of the ROS expansion board cannot be inserted into a 12.6V battery, and an 8.4V battery must be inserted.

The connecting wire of the trolley motor is shown in the figure below:

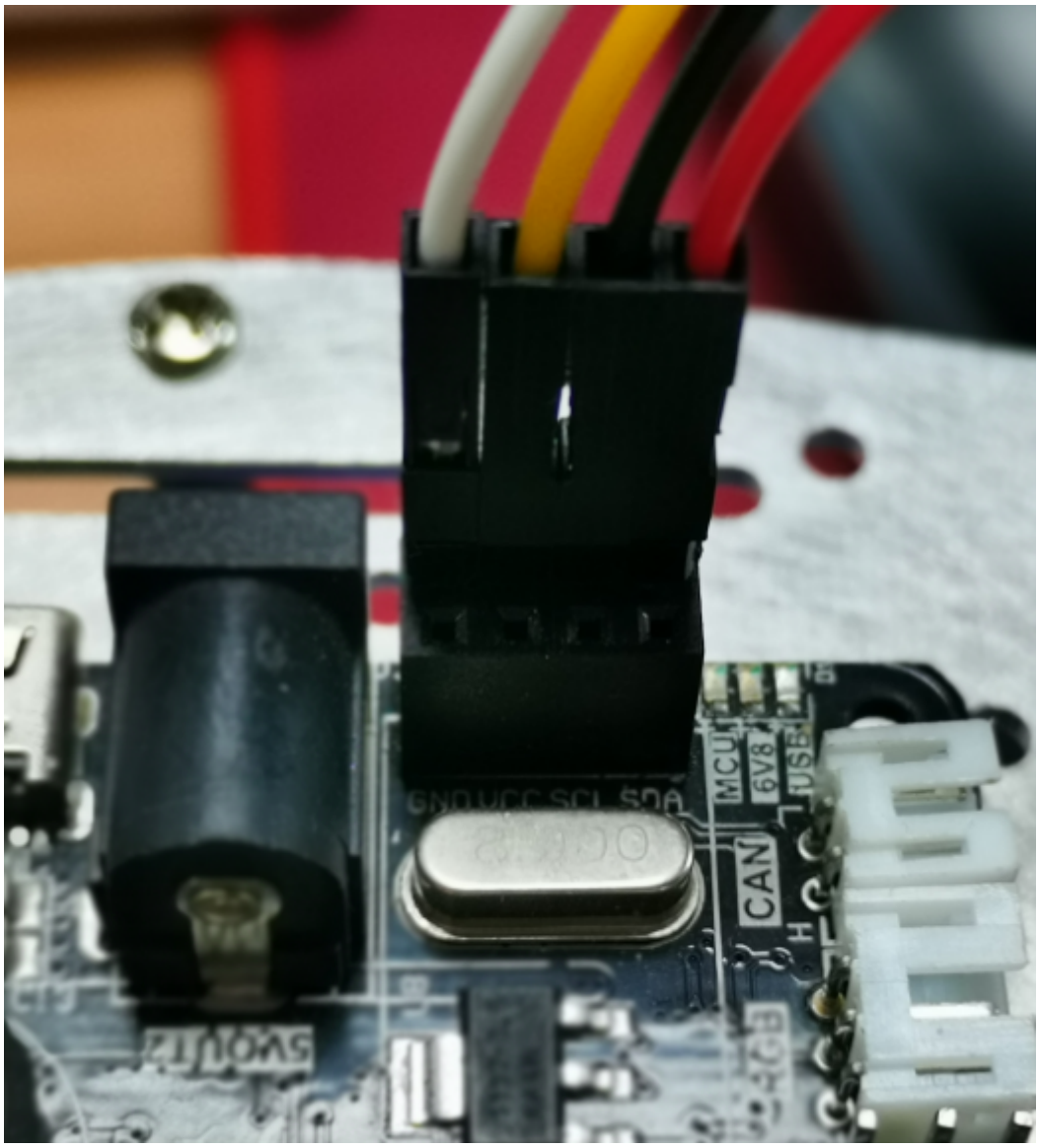
The motor Motor 1 is connected to the left front wheel, the motor Motor 2 is connected to the left rear wheel, the motor Motor 3 is connected to the right front wheel, and the motor Motor 4 is connected to the right rear wheel.。



The line sequence of the connection between the K210 development board and the ROS expansion board is shown in the figure below：

The white wire is connected to GND, the yellow wire is connected to VCC, the black wire is connected to SCL, and the red wire is connected to SDA.

It should be noted here that the logo in the diagram is the I2C line sequence logo, but the K210 uses serial port communication. Since the burned ROS-CAR.hex file has changed this interface to a serial port signal, the actual ROS expansion board The corresponding relationship of the interface is: SCL is actually TX, and SDA is actually RX.



6.2、Experimental goal

This lesson mainly learns the function of K210 development board and car chassis for visual line inspection.

The reference code path for this experiment is：06-export\follow_apriltag.py

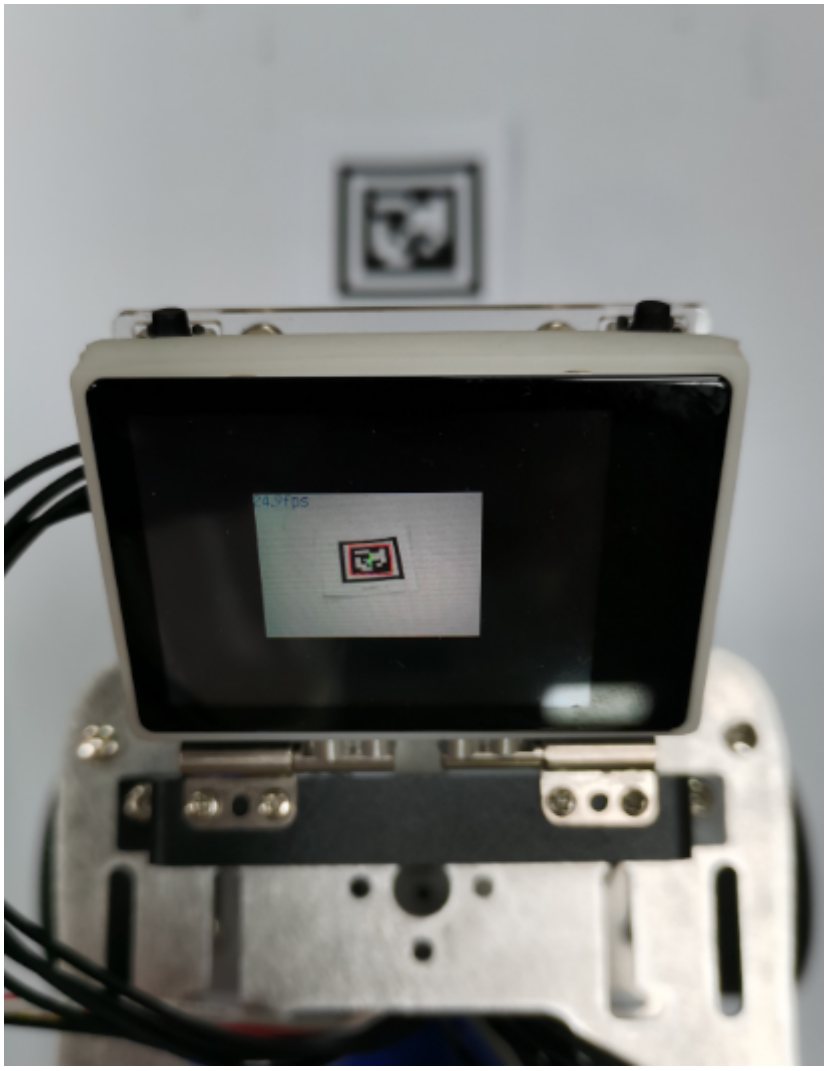
6.3、Experimental steps

1. ROS expansion board flash firmware: ROS-CAR.hex
2. Insert the RGB light bar into the RGB light interface of the ROS expansion board.
3. Please download the trolley driver library and PID control library in the 06-export\library directory to the root directory of the memory card in advance.
4. Open CanMV IDE, open the follow_apriltag.py code and download it to the K210 development board.。

5. Connect the K210 development board to the ROS expansion board through the 4PIN cable
6. Put the car into the white background, move the K210 development board bracket to a suitable angle, and turn on the switch of the car.
7. Place the machine code within the camera collection range of the car, move the machine code, and the car will move with the machine code.

6.4、Experimental effect

After the system initialization is completed, the car will not move when the machine code is not recognized. When the machine code enters the camera collection range of the car, the car will start to follow the machine code and keep the machine code in the middle of the video screen. The range is limited, and the machine code cannot be moved too fast, otherwise it will go out of the frame and cannot follow the machine code.



6.5、Experiment summary

The function of the car following the machine code is to use the K210 development board to obtain the camera image, detect the position of the machine code through the algorithm, calculate the current movement amount of the car motor through the PID algorithm, and then control the car to follow the machine code.