

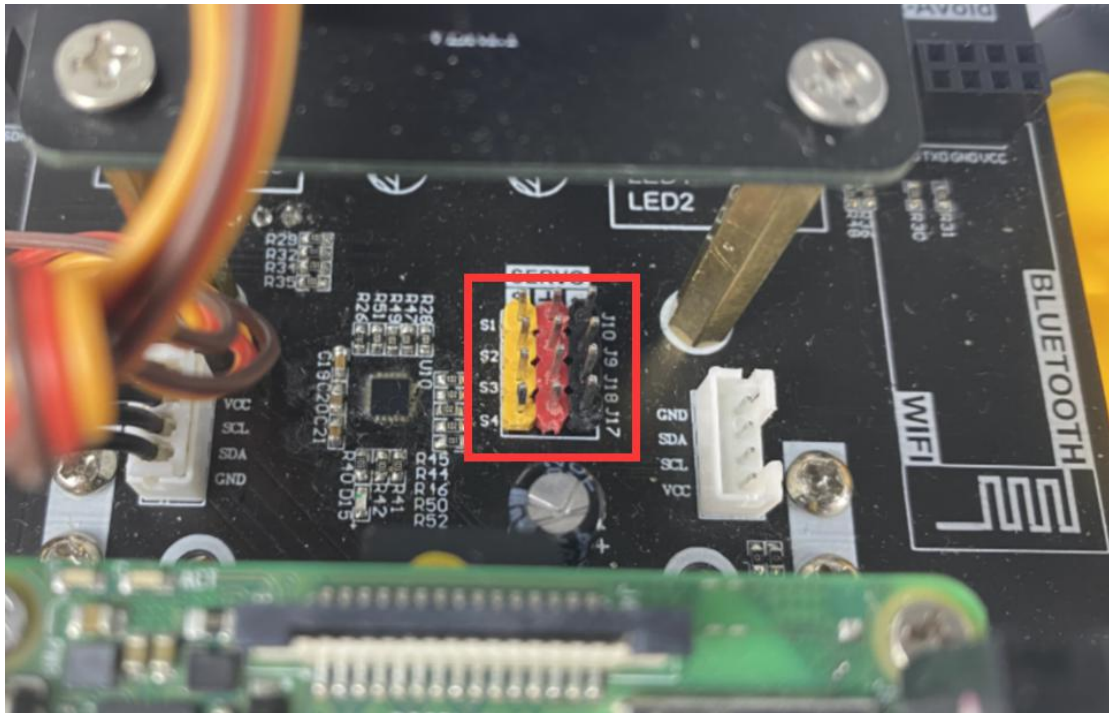
Hardware Control course--Drive servo

1. Learning target

In this course, we will learn how to drive servo of car.

2. Principle

On the drive board of the Raspbot car, we have integrated 4 servo pin interfaces, which are located in the places as shown below(S1~S4).



The driver chip TB6612 of the servo is not directly connected to the Raspberry Pi pins.

The Raspberry Pi communicates with the STM8 MCU through the IIC, and the STM8 MCU drives the TB6612 chip to drive the servo.

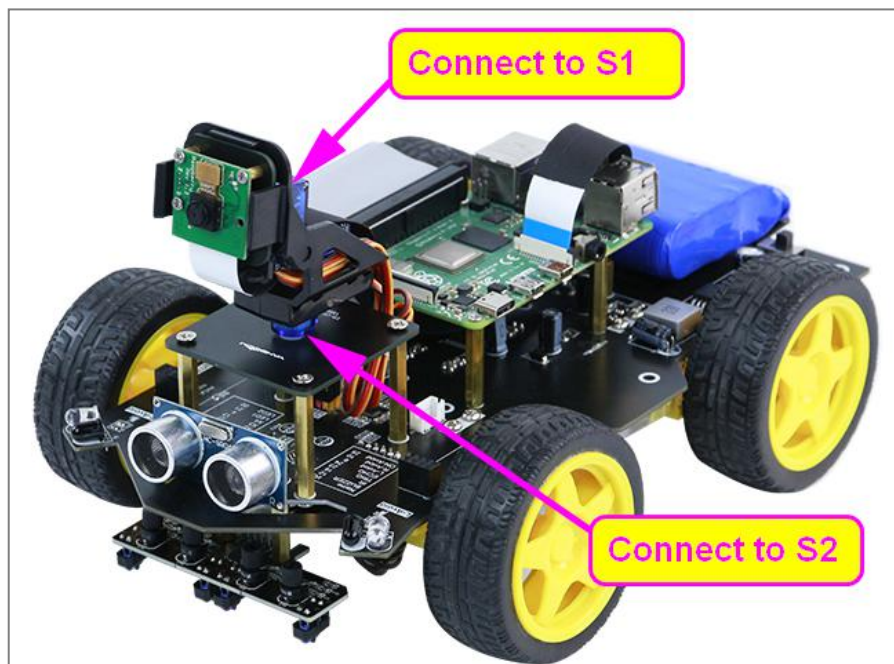
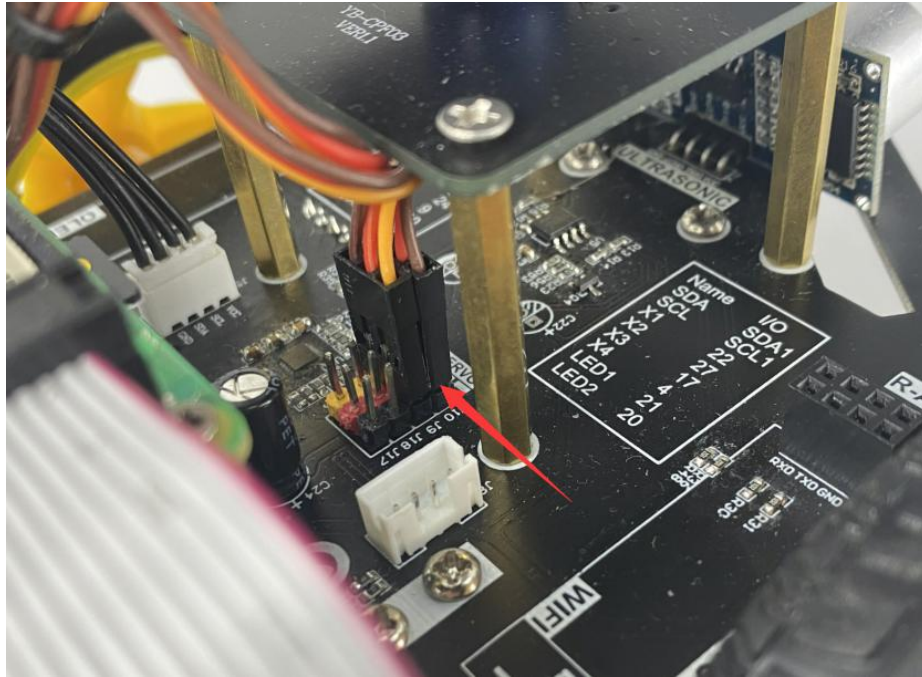
Wiring of the servo:

The brown wire of the servo needs to be connected to the pin marked "-" on the expansion board.

The red wire of the servo needs to be connected to the pin marked "+" on the expansion board.

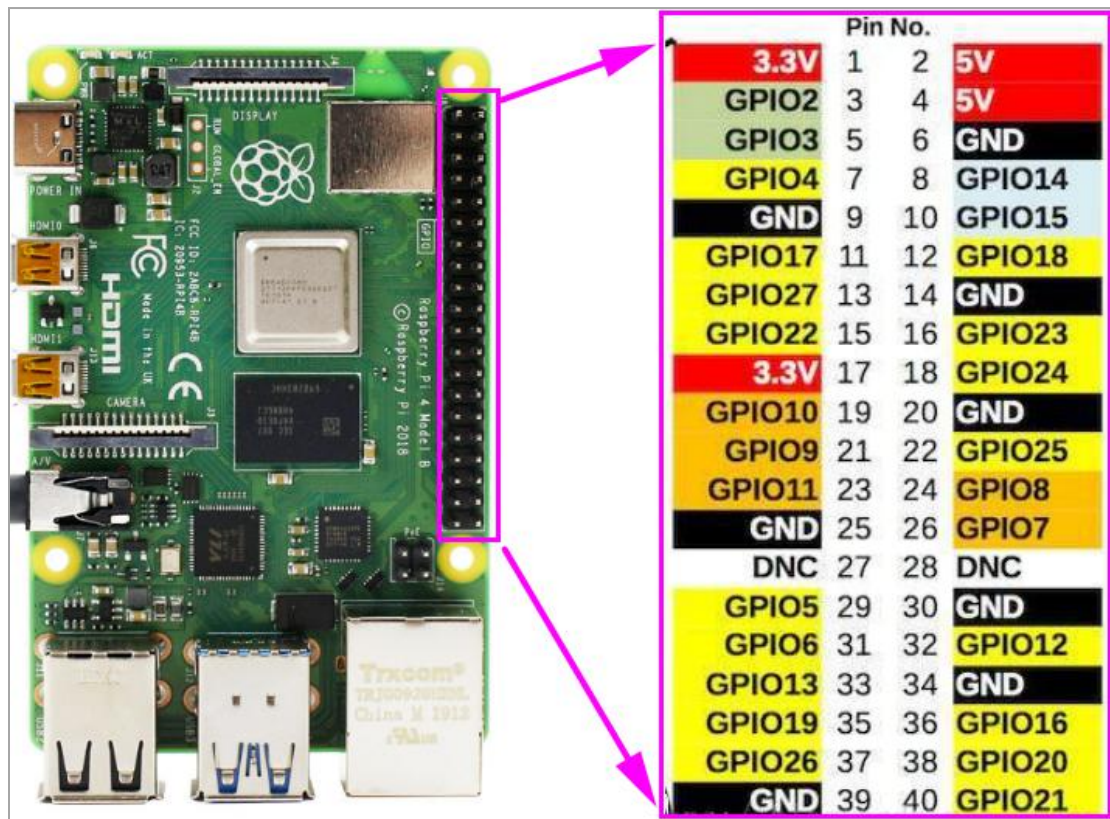
The orange wire of the servo needs to be connected to the pin marked "IO" on the expansion board.

Raspbot car camera platform possess two servos, which are connected to the S1 and S2 ports respectively.



3. Coding method

STM8 is connected to SDA.1, SCL.1 on the Raspberry Pi board.
The pin comparison table of Raspberry Pi as shown below.



wiringPi	BCM	Function	BOARD		Function	BCM	wiringPi
		3.3V	1	2	5V		
8	2	SDA.1	3	4	5V		
9	3	SCL.1	5	6	GND		
7	4	GPIO.7	7	8	TXD	14	15
		GND	9	10	RXD	15	16
0	17	GPIO.0	11	12	GPIO.1	18	1
2	27	GPIO.2	13	14	GND		
3	22	GPIO.3	15	16	GPIO.4	23	4
		3.3V	17	18	GPIO.5	24	5
12	10	MOSI	19	20	GND		
13	9	MISO	21	22	GPIO.6	25	6
14	11	SCLK	23	24	CE0	8	10
		GND	25	26	CE1	7	11
30	0	SDA.0	27	28	SCL.0	1	31
21	5	GPIO.21	29	30	GND		
22	6	GPIO.22	31	32	GPIO.26	12	26
23	13	GPIO.23	33	34	GND		
24	19	GPIO.24	35	36	GPIO.27	16	27
25	26	GPIO.25	37	38	GPIO.28	20	28
		GND	39	40	GPIO.29	21	29

In this course, we use BOARD coding method.

We have provided a library text dedicated to driving motors and servos

--YB_Pcb_Car.py.

It is located in the same directory as the motor driver.

4. About code

Path: /home/pi/Yahboom_project/Raspbot/2.Hardware Control course/2.Drive servo

1) Import time and YB_Pcb_Car library

```
import YB_Pcb_Car
import time

car = YB_Pcb_Car.YB_Pcb_Car()
```

2) Control the two servos to move to the middle position.(90°).

```
car.Ctrl_Servo(1, 90)
time.sleep(0.5)

car.Ctrl_Servo(2, 90)
time.sleep(0.5)
```

3) Control the two servos to move to the middle position.(0°).

```
car.Ctrl_Servo(1, 0)
time.sleep(0.5)

car.Ctrl_Servo(2, 0)
time.sleep(0.5)
```

4) Control the two servos to move to the middle position.(180°).

```
car.Ctrl_Servo(1, 180)
time.sleep(0.5)

car.Ctrl_Servo(2, 180)
time.sleep(0.5)
```

5) After using, we need to release the car object, otherwise, when the next program needs to use the object, it will be unusable due to it is occupied.

```
del car #The object needs to be release
```

5. Running code

Click the button shown in the figure below to run the program on the Jupyter Lab interface



6. Experimental phenomena

Two servo will rotate to $90^\circ \rightarrow 0^\circ \rightarrow 180^\circ$.