4.1 Light sensor

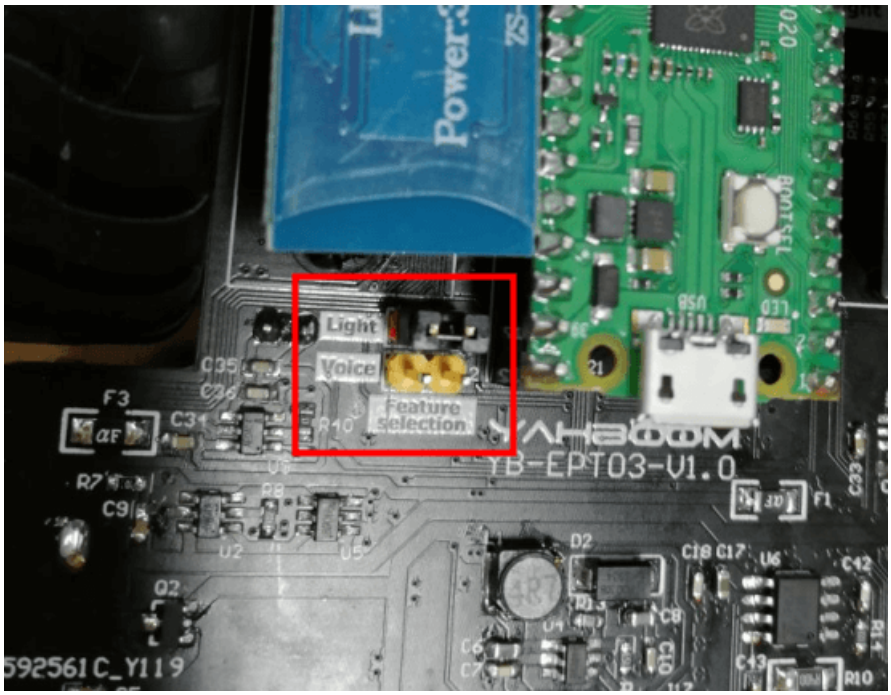
1. Learning Objectives

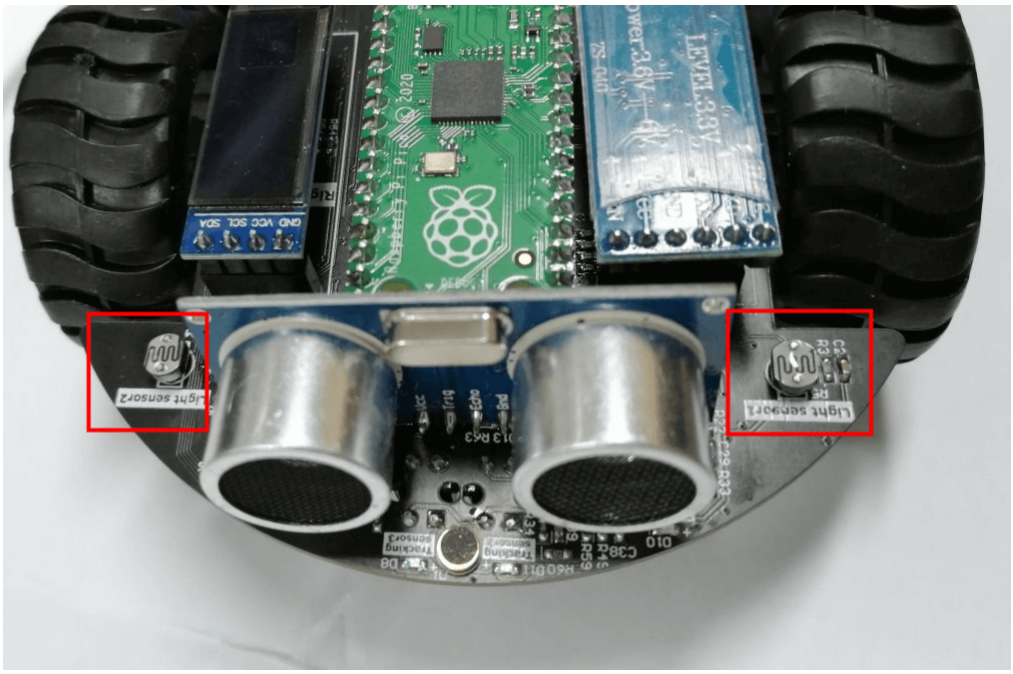
In this course, we will learn how to use the light sensor and OLED on Raspberry Pi Pico robot.

2. About hardware

We need use the photosensitive sensor and OLED on Pico robot expansion board.

Please connect the jumper cap to the Light pin before using. As shown below.





Photoresistors are special resistors made of semiconductor materials such as cadmium sulfide or cadmium selenide, and their working principle is based on the internal photoelectric effect. The stronger the light, the lower the resistance value, and as the light intensity increases, the resistance value decreases rapidly. The sensitivity of the photoresistor to light (that is, the spectral

characteristics) is very close to the response of the human eye to visible light (0.4~0.76) μm. As long as the light that the human eye can perceive, it will cause its resistance to change.

3. About code

Code path: Code -> 2.Advanced course -> 1.Photosensitive sensor.py

```
from pico_car import ds, SSD1306_I2C
from machine import Pin, I2C, ADC
import time

#initialization oled
i2c=I2C(1, scl=Pin(15),sda=Pin(14), freq=100000)
oled = SSD1306_I2C (128, 32, i2c)
#Light1 -> GP27
#Light2 -> GP26
light1 = machine.ADC(27)
light2 = machine.ADC(26)

while True:
    #get value
    LightS1 = light1.read_u16()
    LightS2 = light2.read_u16()
    print("light1 is %d"%(LightS1) )
    print("light2 is %d"%(LightS2) )
    #Display sound is OLED
    oled.text ('Light1:', 0, 0)
    oled.text (str (LightS1), 60, 0)
    oled.text ('Light2:', 0, 10)
    oled.text (str (LightS2), 60, 10)
    oled.show()
    oled.fill (0)
    time.sleep(0.5)
```

from pico_car import SSD1306_I2C

Use SSD1306_I2C of pico_car.

import time

The "time" library. This library handles everything time related, from measuring it to inserting delays into programs. The unit is seconds.

from machine import Pin, I2C, ADC

The machine library contains all the instructions that MicroPython needs to communicate with Pico and other MicroPython compatible devices, extending the language of physical computing, using the Pin, ADC and I2C libraries here.

i2c=I2C(1, scl=Pin(15),sda=Pin(14), freq=100000)

Set the IIC 1 pin to SCL 15, SDA 14, and the frequency to 100000.

oled = SSD1306_I2C (128, 32, i2c)

Initialize the size of the OLED to 128*32, and pass in the IIC parameters set earlier.

light1 = machine.ADC(27)

Initialize ADC port 27, a total of two photosensitive sensors, and set pins 27 and 26 respectively.

oled.text (str (LightS1), 60, 0)

Convert the photosensitive value into a string and display it at the 60,0 position of the OLED.

oled.show ()

Display the set OLED content.

oled.fill (0)

Clear the settings and prepare for the next display.

LightS1 = light1.read_u16()

The light1.read_u16() function is used to detect the value of the sound sensor and assign it to the variable LightS1.

4. Experimental phenomenon

After the code is downloaded, we can see that the first line of the OLED displays the value of photosensitive sensor 1, and the second line displays the value of photosensitive sensor 2.

At the same time, the print windows will also print the value of the photosensitive sensor.

If you block the photosensitive sensor with your hand, the value will change.

Due to the photosensitive sensor is easily affected by ambient light, please use it in a dark place.