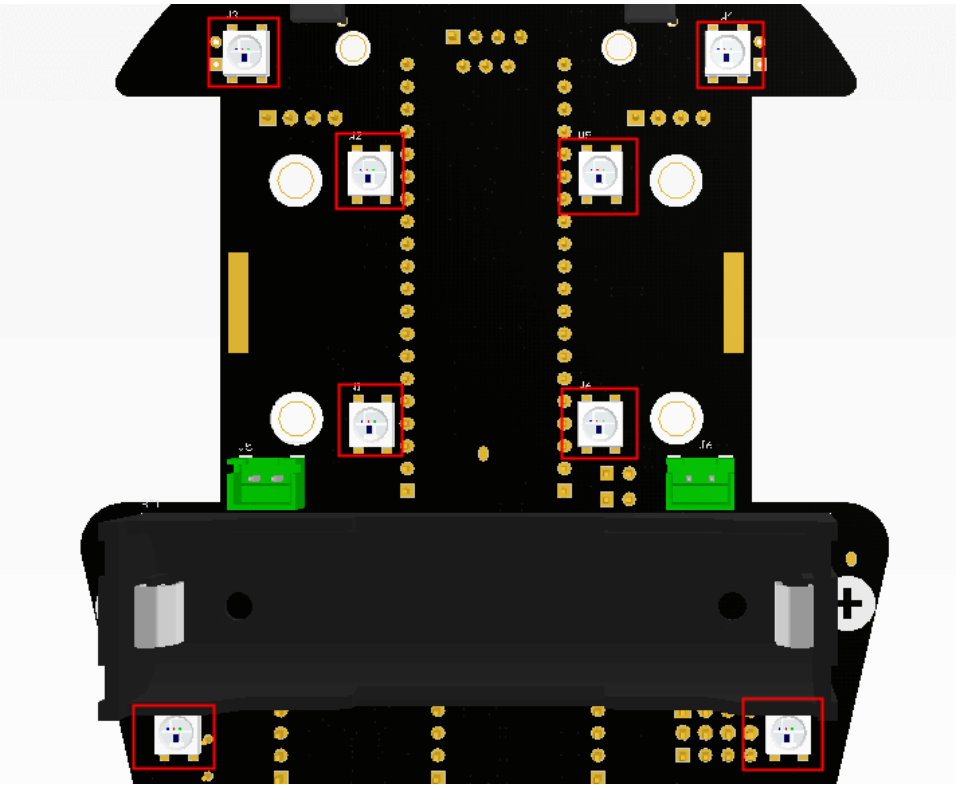
3.4 Breathing light

1. Learning Objectives

In this course, we will learn how to make programmable RGB lights to achieve the effect of breathing lights.

2. About Hardware

We need use RGB lights on Pico robot.



Pico robot has 8 programmable RGB lights, which can realize colorful lighting effects.

The 8 programmable lights have built-in ws2812 chips. Only one port is needed to control 8 lights at the same time through timing control.

The timing control function is encapsulated in the library, we just need to call it to set the color of the light.

3. About Code

Code path: Code -> 1.Basic course -> 4.Breathing light.py

```
import time
from pico_car import ws2812b

num_leds = 8 # Number of NeoPixels
# Pin where NeoPixels are connected
pixels = ws2812b(num_leds, 0)
# Set all led off
pixels.fill(0,0,0)
pixels.show()
# Define variables
i = 0
```

```
brightness = 0
fadeAmount = 1
#breathing
while True:
    for i in range(num_leds):
        pixels.set_pixel(i,0,brightness,brightness)
    pixels.show()
    brightness = brightness + fadeAmount
    if brightness <= 0 or brightness >= 200:
        fadeAmount = -fadeAmount
    time.sleep(0.005)
```

from pico_car import ws2812b

Because only the lights are on, only the ws2812b of pico_car is used here.

import time

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

pixels = ws2812b(num_leds, 0)

Initialize RGB lights, we have 8 RGB lights, here num_leds is set to 8.

pixels.fill(0,0,0)

Set all lights to 0,0,0, that is, turn off all lights, the parameters are (red, green, blue), and the color brightness is 0-255.

pixels.show()

Display the set lights.

pixels.set_pixel(i,0,brightness,brightness)

Use this function to set the color of each light. The parameters are (the number of the light, red, green, blue), the number of the light starts from 0, and the color brightness is 0-255, for example, the first bright red pixels. set_pixel(0,255,0,0).

brightness = 0 fadeAmount = 1

The breathing light effect is achieved by controlling the addition and subtraction of these two values.

4. Experimental Phenomenon

After the code is downloaded, we can see that the cyan RGB lights are constantly turning on and off with breathing effect.