STM32 balancing car

1. Experimental preparation

1. Knowledge reserve

- Good programming ability (mainly C language)
- Familiar with the architecture of stm32

2. Material preparation

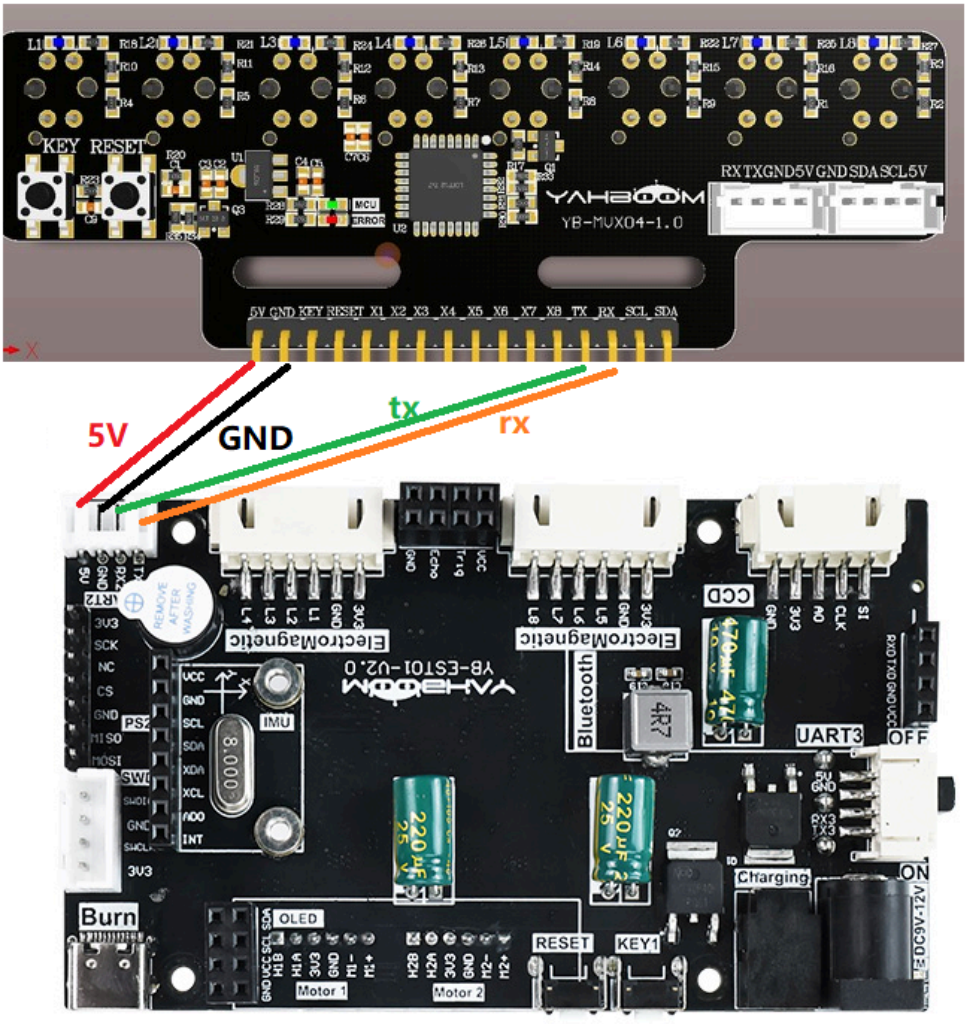
- STM32 balancing car *1
- Eight-way tracking module *1
- 12V battery *1
- Several Dupont wires

2. Car wiring

Wiring of balancing car and infrared sensor (this example uses serial communication)

Balancing Car	Infrared sensor
TX2	RX
RX2	TX
5V	5V
GND	GND

As shown in the figure:



Main procedures

```
int main(void)
{

    Mid_Angle = -1; //Obtain based on the car


    bsp_init();

    MPU6050_EXTI_Init();                    //This interrupt service function is
placed last

    while(!Key1_State(1));
    send_control_data(0,0,1);//Send and receive digital data
    Stop_Flag = 0; //Start controlling
```

```
//  OLED_Draw_Line("start tracking!", 1, true, true);

    delay_time(10);//delay 100ms

    while(1)
    {

        if(g_new_package_flag == 1)
        {
            g_new_package_flag = 0;
        }

    }
}
```

This project uses an external interrupt to perform PID processing for line patrol according to the value of the infrared probe (every 5ms), so that line patrol can be completed on a map with black lines and white background.

In app_irtrackin.c, there is a parameter for adjusting PID line patrol. If you want to increase or decrease the speed and optimize the effect, you can adjust the macro definition value inside.

```
#define IRTrack_Trun_KP (250) //P
#define IRTrack_Trun_KI (0.0001) //I
#define IRTrack_Trun_KD (0.05) //D

#define Track_Speed 15            //Line patrol speed
```

- IRTrack_Trun_KP: P value of pid line patrol
- IRTrack_Trun_KI: I value of pid line patrol
- IRTrack_Trun_KD: D value of pid line patrol
- IRR_SPEED: Speed of line patrol

Experimental phenomenon:

On the premise of ensuring that the wiring and installation are correct, after the 8-way line patrol module is calibrated, press the key1 button to start line patrol.

If the 8-way module probe cannot detect the black and white lines normally, you need to wait for the module to work normally before pressing the key1 button

If the floor is black, you need to put a piece of white paper under our map to cover the black. The main reason is that the material of the map is relatively transparent, which has a greater impact on the 8-way line patrol sensor.