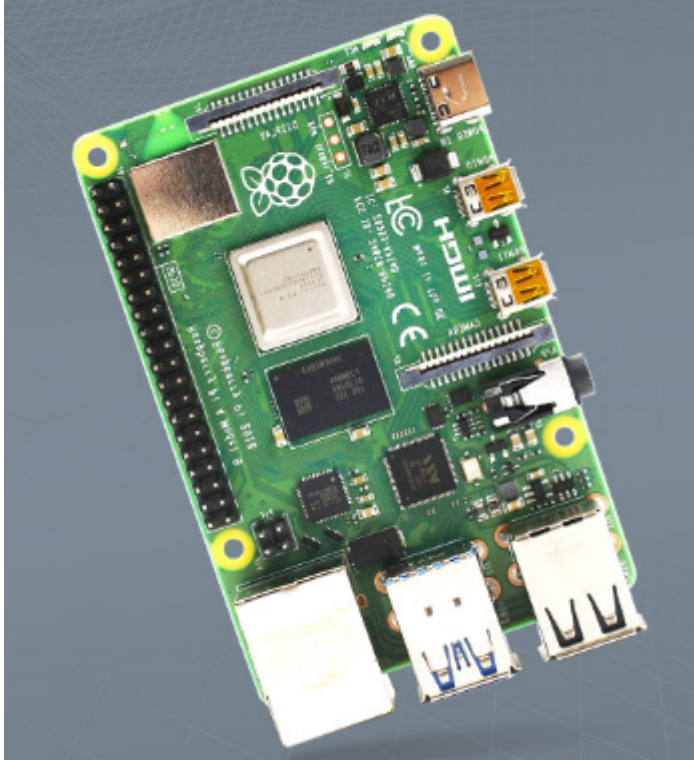


Using of 270° Servo --- Raspberry Pi

1.Preparation

Raspberry Pi board *1



270° servo *1



7.4V battery *1

2.Purpose

After the Raspberry Pi is powered on, after a delay of 0.5 seconds, the steering gear starts to cycle from 0-270-0.

3.实验原理

The working principle of the servo: the control signal enters the signal modulation chip from the channel of the receiver to obtain the bias voltage of the DC. It has a reference circuit inside, which generates a reference signal with a period of 20ms and a width of 1.5ms. It will compares the DC bias voltage with the voltage of the potentiometer to obtain a voltage difference and output. The positive and negative of the voltage difference is outputted to the motor drive chip to determine the forward and reverse of the motor. Servo rotation angle is by adjusting the duty ratios of PWM (pulse width modulation) signal. The standard PWM (pulse width modulation) signal has a fixed period of 20ms (50Hz). Theoretically, pulse width distribution should be between 1 ms to 2 ms, but in fact between pulse width can be 0.5 ms and 2.5 ms. Pulse width and the servo rotation angle $0^{\circ} \sim 180^{\circ}$ corresponds, as shown below.

0.5ms-----	0°
1.0ms-----	45°
1.5ms-----	90°
2.0ms-----	135°
2.5ms-----	180°

4.Steps

4.1 Schematic diagram

wiringPi	BCM	Function	Physical pin		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

4.2 Wiring

1. The red wire (positive pole) of the servo is connected to the positive pole of the 7.4V battery
2. The brown wire (negative pole) of the servo is connected to the negative pole of the 7.4V battery
3. The yellow wire (signal wire) of the servo is connected to the physical pin (8-pin) of the raspberry pie motherboard, GPIO4
4. The Raspberry Pi board is powered by the computer, and any GND interface on the board is connected to the negative pole of the battery

4.3 Code

Input following command

```
gcc ServoControlCorlor.c -o ServoControlCorlor -lwiringPi -lpthread #Compile
command
```

```
./ServoControlCorlor #Execute command
```

5.Code

```

/**
 * Function.....main
 * @author.....
 * @date.....
 * @brief.....First delay 0.5, then call the steering gear control program
 * @param[in].....void
 * @retval.....void
 * @par History...No
 */
void main()
{
    ..//wiringPi initialization
    ..wiringPiSetup();
    ..
    ..//Steering gear is set to output mode
    ..pinMode(ServoPin, OUTPUT);
    ..
    ..//Initialize the servo position
    ..int ServoPos = 0;
    ..servo_pulse(ServoPos);
    ..
    ..while(1)
    ..{
    ..    ..//delay 0.5s
    ..    ..delay(500);
    ..    ..//Call the servo control program
    ..    ..servo_control_color();
    ..}
    ..return;
}

```