**Infrared Obstacle Avoidance Module**

**Overview**

The purpose of this course will use the Raspberry Pi to control the infrared obstacle avoidance module. The infrared obstacle avoidance module is used to detect obstacles and to control the brightness of LED lights by capturing the signal of infrared obstacle avoidance module.

**The Experimental Materials**

Raspberry Pi \* 1

Breadboard \* 1

Infrared obstacle avoidance module \*1.

Led \* 1

Resistor(330Ω) x1

Dupont Line

**The Preparatory Work**

1. Install the python interpreter in your Raspberry Pi system.

2. Install the rpi.gpio library in your Raspberry Pi system.

3. Install wiring Pi library in your Raspberry Pi system.

For more details, please refer to the attachment for installing the python interpreter and corresponding libraries in the Raspberry Pi system.

Product Description

Brief Introduction

The infrared obstacle avoidance sensor is a kind of adjustable obstacle avoidance sensor designed for wheeled robots. This sensor light is adaptable to the environment and high precision. It has a pair of infrared transmitting and receiving tube. The tube emits a certain frequency of infrared light. When the detection direction meets an obstacle (reflecting surface), the infrared reflection is received by the receiving tube. At this time, the indicator light is on. After the circuit processing, the signal output interface output digital signal and the detection distance can be adjusted by the potentiometer knob. The effective distance is 2 ~ 40cm and the working voltage is 3.3V-5V. Due to the wide range of operating voltage, it can work stably under the condition that the power supply voltage fluctuates greatly. It is suitable for various single chip microcomputer, Arduino controller, BS2 controller, and can be installed on the robot to detect the changes of the surrounding environment.



**Characteristic Parameters**

◆Working Voltage: DC 3.3 v-5v

◆Working Current: ≥ 20mA.

◆Working Temperature: - 10 ℃ to + 50 ℃

◆Detection Distance: 2 ~ 40 cm

◆IO Interface: 4 Wire Interface (-/+/S/EN)

◆Output Signal: TTL level (low level with obstruction, high level without obstruction)

◆Adjust Way: Multi - coil Resistance Adjustment

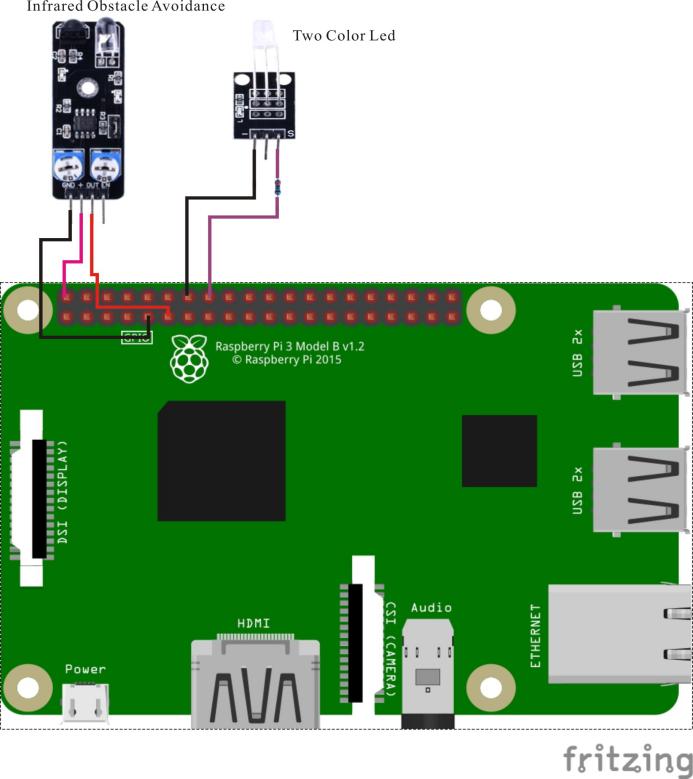
◆ Effective Angle: 35 °

◆Size: 45mm x 18mm

◆205 Resistance: Adjust Distance.

◆103 Resistance: Adjust the Frequency

Wiring diagram



**The Sample Code**

1. **Python Code**

#!/usr/bin/env python

import RPi.GPIO as GPIO

ObstaclePin = 11

LedPin = 16

def setup():

GPIO.setmode(GPIO.BOARD) # Numbers GPIOs by physical location

GPIO.setup(ObstaclePin, GPIO.IN, pull\_up\_down=GPIO.PUD\_UP)

GPIO.setup(LedPin, GPIO.OUT)

def loop():

while True:

if (0 == GPIO.input(ObstaclePin)):

print "Barrier is detected !"

GPIO.output(LedPin, True)

else:

GPIO.output(LedPin, False)

def destroy():

GPIO.cleanup() # Release resource

if \_\_name\_\_ == '\_\_main\_\_': # Program start from here

setup()

try:

loop()

except KeyboardInterrupt:

destroy()

1. **C Code**

#include <wiringPi.h>

#include <stdio.h>

#define ObstaclePin 0

#define LedPin 4

int main(void)

{

if(wiringPiSetup() == -1)

{

printf("setup wiringPi failed !\n");

return -1;

}

pinMode(LedPin, OUTPUT);

while(1)

{

if(0 == digitalRead(ObstaclePin))

{

printf("Barrier detected!\n");

digitalWrite(LedPin, HIGH);

}

else

{

digitalWrite(LedPin, LOW);

}

}

return 0;

}

**The experimental phenomena**

When the infrared obstacle avoidance module detects the obstacle, the LED light is on. When the obstacle is out of the detection range, the LED light is off.