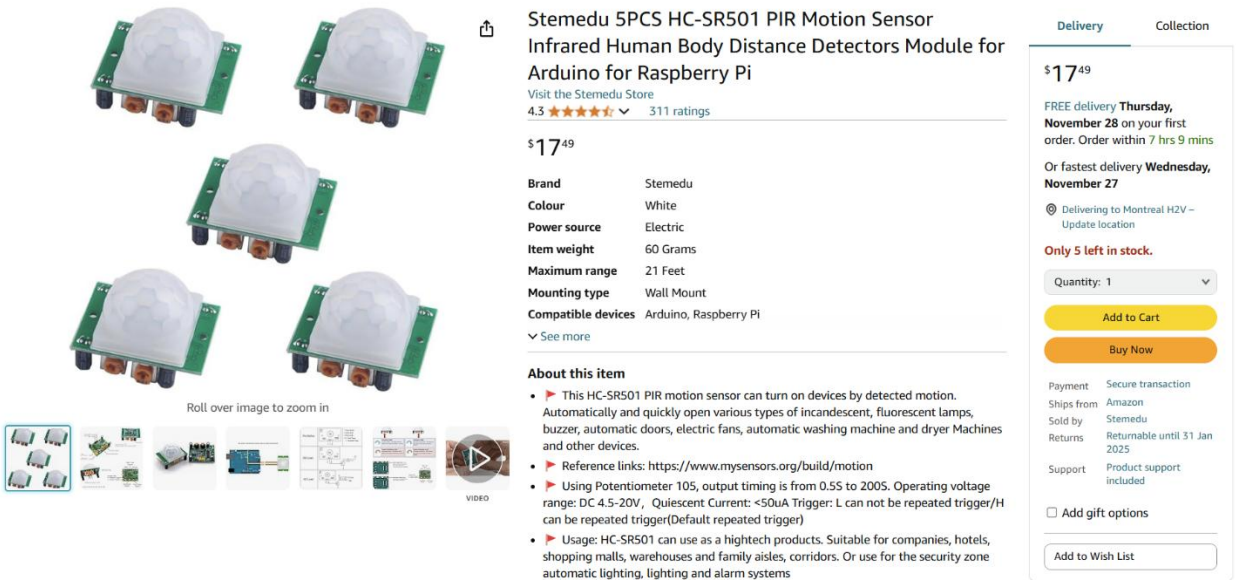
Date: 2024-11-19

What is needed:

- Raspberry Pi 4 model b (with a microSD card preloaded with Raspberry Pi OS)
- Raspberry Pi Camera. The one I got for this project is this:

- PIR Motion Sensor which should have three pins: VCC, GND, and OUT

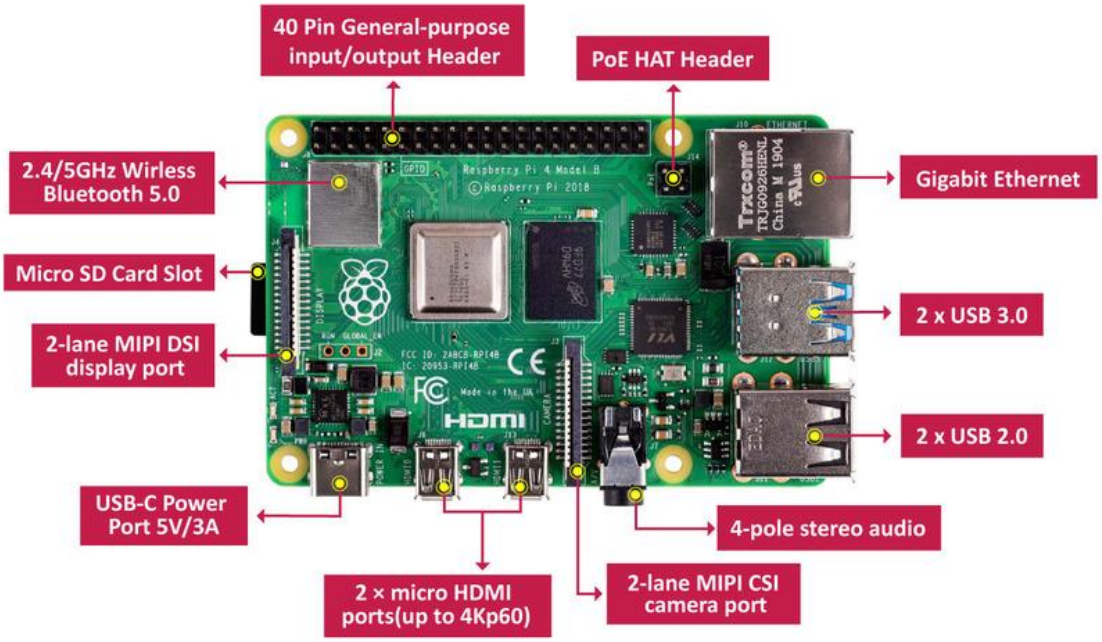


- Jumper wires to connect the PIR sensor to the Raspberry Pi GPIO pins (female to female wire is recommended)

Date: 2024-11-20

Plugging the camera to the model (Shaheryar did this part):

- Make sure the Raspberry Pi is turned off.
- Find the 2-lane MIPI CSI camera port. (image bellow helps you locate it)



- Lift the plastic latch of the CSI upward.
- Attach the ribbon cable to the camera port and make sure the metal connectors on the ribbon cable are facing the HDMI port.
- Push the latch back down to secure.

Date: 2024-11-20

Making sure the camera is properly connected (Shaheryar did this part):

- Turn on the raspberry pi
- Connect the raspberry pi model to the laptop using usb-c to usb-c cable.
- Open terminal and type “ssh <username>@<ip address of the raspberry pi>
- Update the system by typing the following in the terminal:

sudo apt update

sudo apt upgrade -y

- Open the Raspberry Pi configuration tool by typing:

sudo raspi-config

Then go to Interface Options -> I2C and enable it.

- Reboot the raspberry pi by typing:

sudo reboot

- Use RealVNC Viewer to see the Raspberry pi OS

Date: 2024-11-20

Testing the camera (Shaheryar did this part):

- Install the libcamera tools by typing:

sudo apt update

sudo apt install -y libcamera-apps

- Now to test the camera we type:

Libcamera-jpeg -o test.jpg

- This should save an image in the home directory

For the last 3 steps this video can be used as visual step by step:

https://youtu.be/yhM1NhD-kGs?si=GXFxC2PB8wAONrHW

Date: 2024-11-21

Installing the Python library (Amir did this):

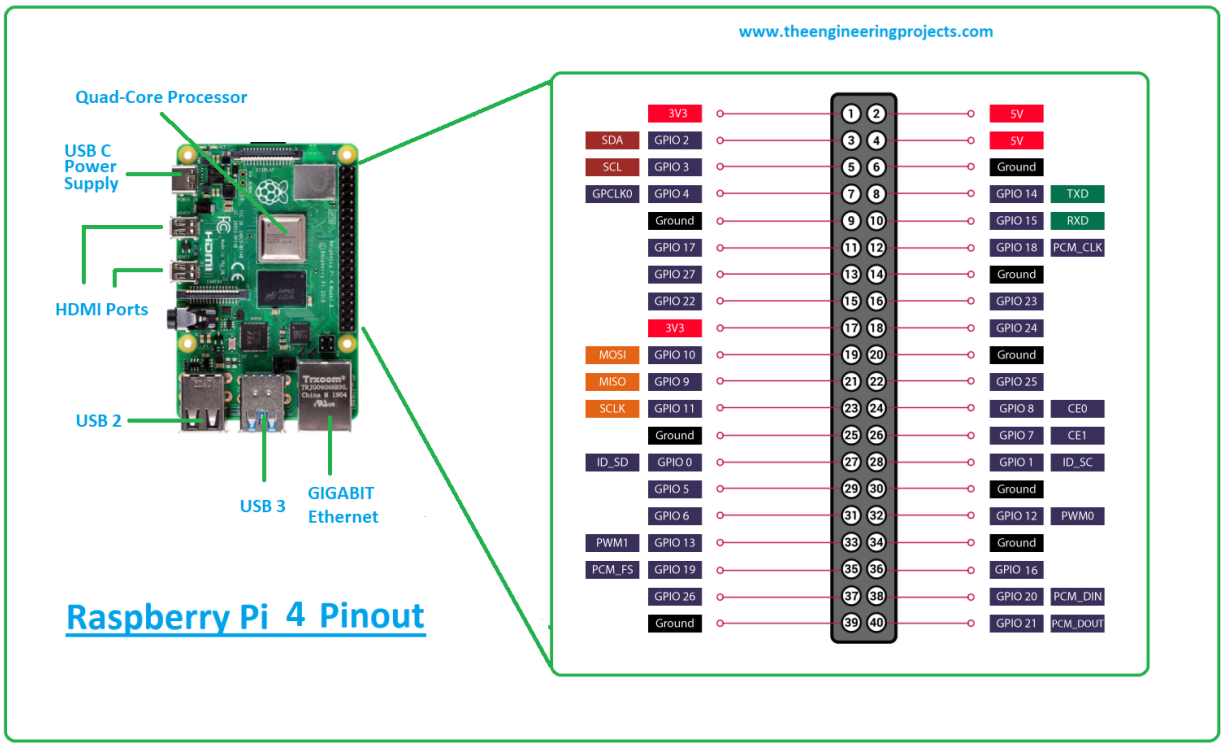
- Install the python library by typing:

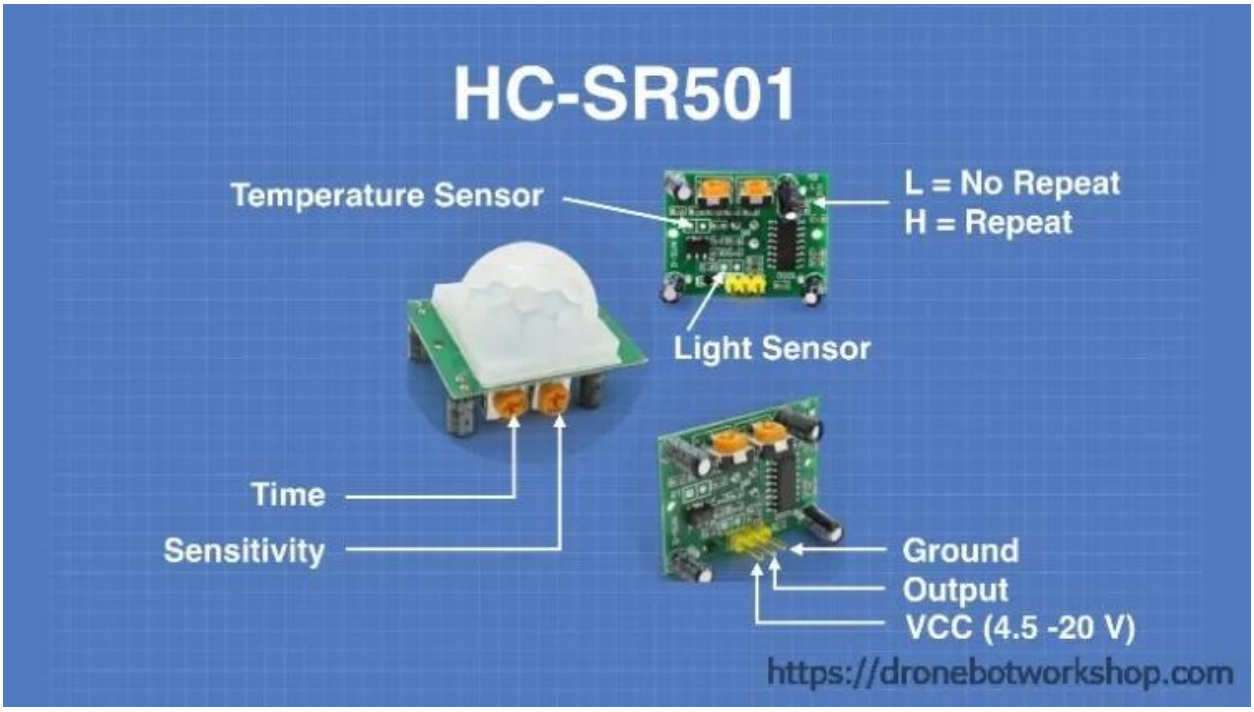
sudo apt-get install python3-picamera

Date: 2024-11-22

Connecting the PIR Motion Sensor and Camera (Shaheryar did this part):

use these pictures for this step:





- Connect the VCC to 5V (Pin 2) on the Raspberry Pi via jumper wires
- Connect GND to GND (Pin 6) on the Raspberry Pi
- Connect OUT to GPIO23 (Pin 16)

Date: 2024-11-22

Creating a new file to include the script (Amir did this):

- Create a new file

sudo nano project.py

- Include the following code:

```
import RPi.GPIO as GPIO
import time
import picamera
import os

# Pin to which the motion sensor is connected
SENSOR_PIN = 23

# Folder to save pictures
SAVE_FOLDER = "/home/pi/motion_pics"

# Create the folder if it doesn't exist
if not os.path.exists(SAVE_FOLDER):
    os.makedirs(SAVE_FOLDER)

# Initialize the camera
camera = picamera.PICamera()

# Set up GPIO mode
GPIO.setmode(GPIO.BCM)
GPIO.setup(SENSOR_PIN, GPIO.IN)

# Callback function to take a picture when motion is detected
def my_callback(channel):
    timestamp = time.strftime("%Y%m%d-%H%M%S")
    picture_filename = os.path.join(SAVE_FOLDER, f"motion_{timestamp}.jpg")
    camera.capture(picture_filename)  # Capture and save the picture
    print(f'Motion detected! Picture saved: {picture_filename}')

try:
    # Detect motion and trigger the callback
    GPIO.add_event_detect(SENSOR_PIN, GPIO.RISING, callback=my_callback)

    # Keep the program running
    while True:
        time.sleep(100)

except KeyboardInterrupt:
    print("Exiting program...")
finally:
    GPIO.cleanup()  # Clean up GPIO resources when done
```

- Run the script to make sure it works by typing:

Python3 project.py

- Image should be saved at /home/pi/motion_pics

For step 5 and 6, use this website: Connect and control Raspberry Pi motion detector PIR

Took the main idea from the website script code but asked the AI to add so that it takes picture when motion is detected.

Date: 2024-11-23

Transfer from Raspberry pi to laptop using SSH (Amir did this):

- Ensure the SSH is enabled on raspberry pi by using

sudo raspi-config

- Then navigate to Interface options -> SSH and enabling it if not enabled.
- Use the following command to get raspberry pi IP:

hostname -i

- Use the following command to transfer image to the laptop:

Scp <username>@<ip address>:/home/pi/<image name>.jpg ~/Downloads

- Verify the file is appearing in your laptop

Link to GitHub repo: https://github.com/Shehryyy/UnixProject.git