Face detection for attendance

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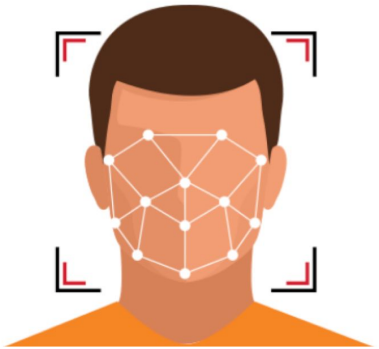
Motivation

This project aims to use motion sensor and camera to capture image and futher extend the use of face detection algorithm.



purpose

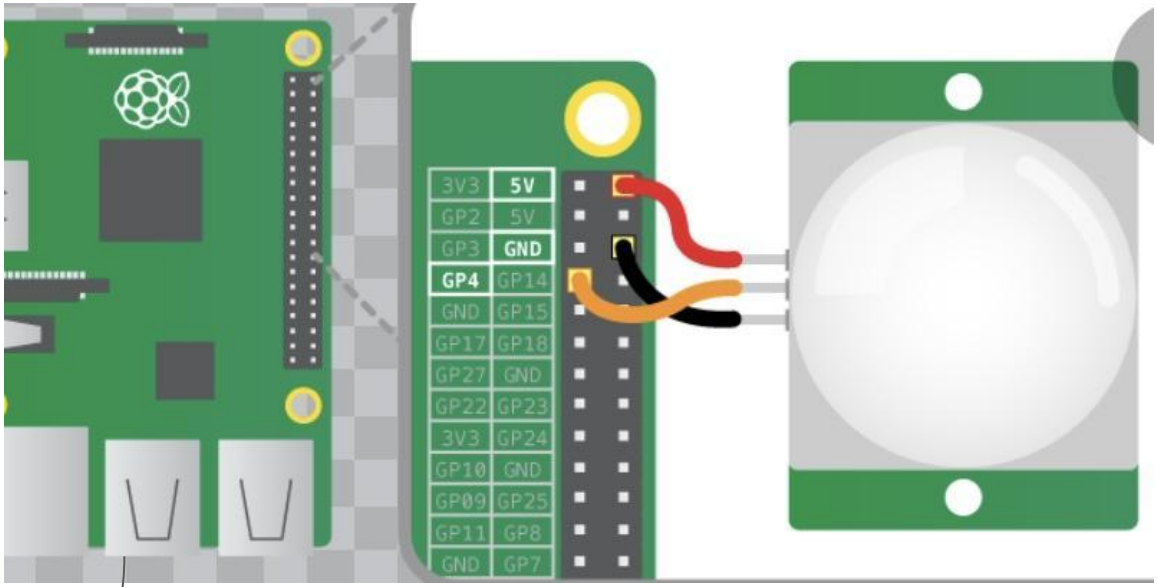
Currently, taking attendance can be easily done by just using ticking boxes from the name list. This method can be easily get passed by having a friend to help to take the attendance for you. So, by adding a system that capture the face and save the image will be a good solution to the problem. It can make sure the person have really attend the class.

Functional spec

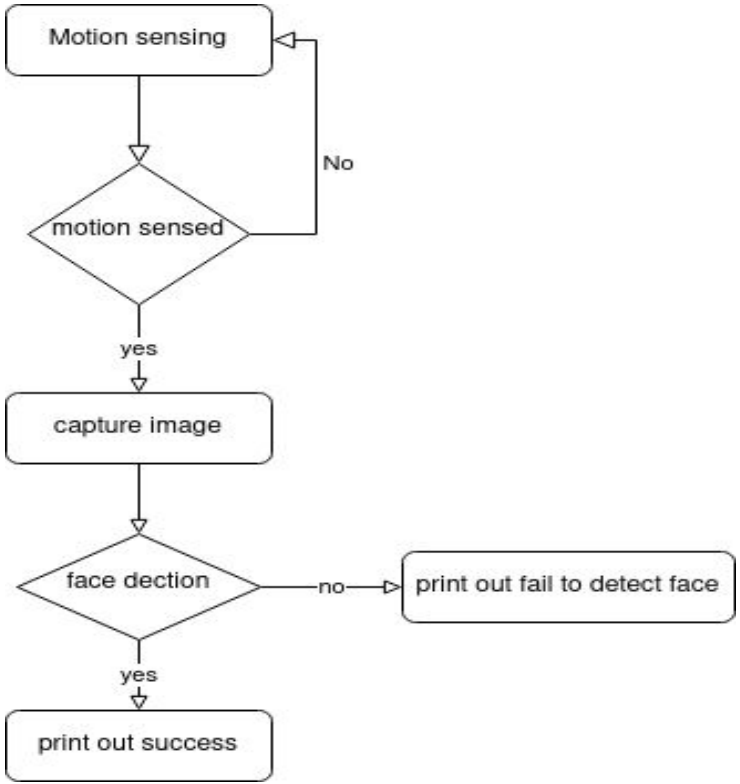
- Need a Rasberry pi and support python 3
- PIR sensor and usb camera is needed
- The project should be able to detect motion, capture and store image and include face detection
- By sensing motion, the camera should be able to capture the image and store the image if face is detected. If no motion is detected, the system will wait for response. If no face is detected in the captured image, the fail message is printed out.

System architecture

usb
camera



operation flow



used device

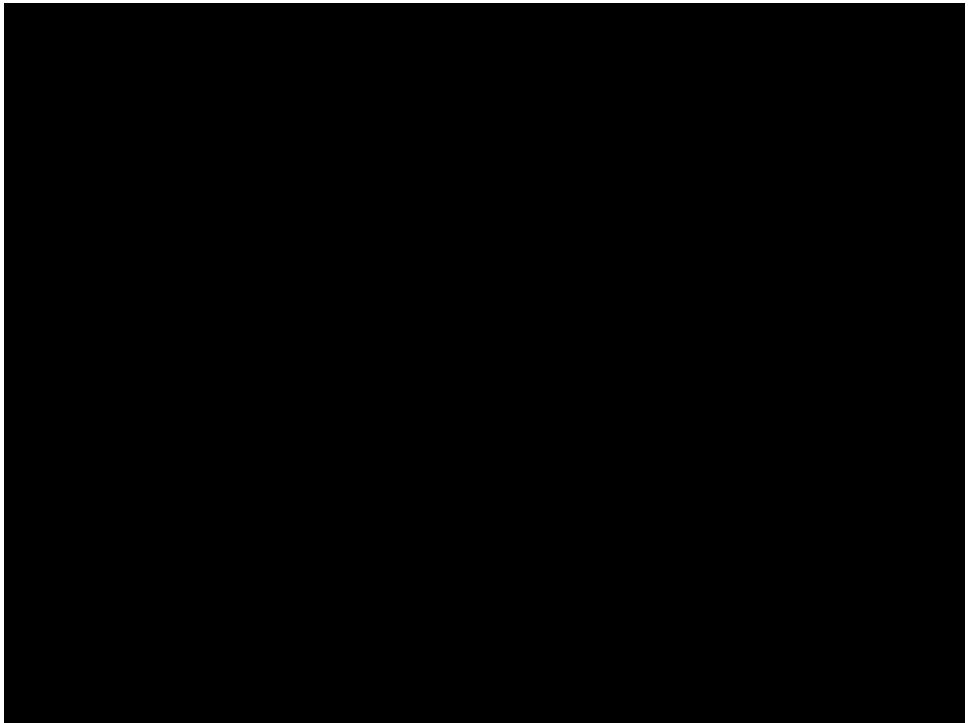
USB camera

Rasberry pi

PIR sensor

movie

https://youtu.be/3UhFJzU4ovk



Code

```
from gpiozero import MotionSensor

import cv2

pir = MotionSensor(4)

cam = cv2.VideoCapture(0)

faceCascade =
cv2.CascadeClassifier('./opencv-master/data/haarcascades/haarcascade_frontalface_defa
ult.xml')


while True:

    print("please wave your hand on the sensor")

    pir.wait_for_motion()

    print("please wait for 2 seconds")

    pir.wait_for_no_motion()

    ret,image = cam.read()

    k = cv2.waitKey(1)

    if k != 1:

        break

gray = cv2.cvtColor(image, cv2.COLOR_RGB2GRAY)

faces = faceCascade.detectMultiScale(gray)

if len(faces) ==0:

    print("Failed to detect face")

    print("try taking off your mask")


for (x, y, w, h) in faces:

    cv2.rectangle(image,(x,y),(x+w,y+h), (0,255,0),2)

    print("face dectected")

    print("success")

cv2.imwrite('/home/pi/ex7/face.jpg', image)

cam.release()

cv2.destroyAllWindows()
```

reference

https://projects.raspberrypi.org/en/projects/physical-computing/11

https://www.circuitbasics.com/detecting-motion/

https://robu.in/real-time-face-detection-using-raspberry-pi-connections-and-code/