**PYTHON CODE**

#Face Recognition using Webcamera and embedded system #

from cv2 import cv2

import serial

import time

arduinoSerialData = serial.Serial('COM3',9600)

def generate\_dataset(img,id,img\_id):

cv2.imwrite("data1/user."+str(id)+"."+str(img\_id)+".jpg",img)

def draw\_boundary(img,classifier,scaleFactor, minNeighbors,color,text,clf):

gray\_img = cv2.cvtColor(img,cv2.COLOR\_BGR2GRAY)

features = classifier.detectMultiScale(gray\_img, scaleFactor, minNeighbors)

coords = []

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

cv2.rectangle(img,(x,y),(x+w,y+h),color,2)

id,\_ = clf.predict(gray\_img[y:y+h,x:x+w])

#time.sleep(2)

#print('Someone entered the room')

#arduinoSerialData.write('N'.encode())

if id == 1:

cv2.putText(img,"Deepika Padukone",(x,y-4),cv2.FONT\_HERSHEY\_SIMPLEX,0.8,(0,255,255),2,cv2.LINE\_AA)

arduinoSerialData.write('H'.encode())

time.sleep(5)

arduinoSerialData.write('N'.encode())

time.sleep(2)

elif id == 2:

cv2.putText(img, "NarendraModi", (x, y - 4), cv2.FONT\_HERSHEY\_SIMPLEX, 0.8, (0, 255, 255), 2, cv2.LINE\_AA)

arduinoSerialData.write('R'.encode())

time.sleep(5)

arduinoSerialData.write('N'.encode())

time.sleep(2)

elif id == 3:

cv2.putText(img, "Shivani", (x, y - 4), cv2.FONT\_HERSHEY\_SIMPLEX, 0.8, (0, 255, 255), 2, cv2.LINE\_AA)

arduinoSerialData.write('H'.encode())

time.sleep(5)

arduinoSerialData.write('N'.encode())

time.sleep(2)

elif id == 4:

cv2.putText(img, "other empoyee", (x, y - 4), cv2.FONT\_HERSHEY\_SIMPLEX, 0.8, (0, 255, 255), 2, cv2.LINE\_AA)

time.sleep(2)

arduinoSerialData.write('N'.encode())

time.sleep(2)

else:

cv2.putText(img, "Unknown", (x, y - 4), cv2.FONT\_HERSHEY\_SIMPLEX, 0.8, (0, 255, 255), 2, cv2.LINE\_AA)

time.sleep(2)

arduinoSerialData.write('R'.encode())

time.sleep(5)

arduinoSerialData.write('N'.encode())

time.sleep(2)

coords = [x,y,w,h]

return coords

def recognize(img,clf,faceCascade):

coords = draw\_boundary(img,faceCascade,1.1,10,(0,255,0),"Face",clf)

return img

faceCascade = cv2.CascadeClassifier("haarcascade\_frontalface\_default.xml")

clf = cv2.face.LBPHFaceRecognizer\_create()

clf.read("classifier1.yml")

def detect(img,faceCascade,img\_id):

#color = ("blue":(255,0,0), "red":(0,0,255), "green":(0,255,0), "white":(255,255,255))

coords, img = draw\_boundary(img,faceCascade,1.3,6,(0,255,0),"Face",clf)

if len(coords)==4:

roi\_img = img[coords[1]:coords[1]+coords[3],coords[0]:coords[0]+coords[2]]

user\_id = 1

generate\_dataset(roi\_img,user\_id,img\_id)

return img

video\_capture = cv2.VideoCapture(0)

#img\_id = 0

while True:

#time.sleep(1)

print (arduinoSerialData.readline()) #read the serial data and print it as line

b = (arduinoSerialData.readline())

#print (b)

d = b.decode()

#print (d)

c = 'Person Detected\r\n'

#print(c)

if d==c:

time.sleep(2)

ret,img = video\_capture.read()

#img = detect(img,faceCascade,img\_id)

img = recognize(img,clf,faceCascade)

cv2.imshow("Face detection started stand infront of camera ",img)

time.sleep(1)

#img\_id += 1

if cv2.waitKey(1)& 0xFF == ord('q'):

break

video\_capture.release()

cv2.destroyAllWindows()