Recognize.py

import cv2

from imutils import face\_utils

import numpy as np

import argparse

import imutils

import dlib

import math

from PIL import Image

from subprocess import call

import os

import threading

import time

import tensorflow as tf

from tensorflow import keras

import os

os.environ['TF\_CPP\_MIN\_LOG\_LEVEL'] = '2'

import face\_recognition

#Set name of new user

currentUser = raw\_input("Enter name of current user : ")

model = keras.models.load\_model(currentUser + '.model')

#Importing Haar cascade and DLIB's facial landmarks detector

face\_cascade = cv2.CascadeClassifier('haarcascade\_frontalface\_default.xml')

predictor = dlib.shape\_predictor("shape\_predictor\_68\_face\_landmarks.dat")

# Start video capture (webcam)

video = cv2.VideoCapture(0)

while(True):

    ret, frame = video.read()

    cv2.imshow('Original video feed', frame)

    #Convert the frame to grayscale

    grayFrame = cv2.cvtColor(frame, cv2.COLOR\_BGR2GRAY)

    #Activating Haar cascade classifier to detect faces

    faces = face\_cascade.detectMultiScale(grayFrame, scaleFactor = 1.5, minNeighbors = 5)

    for(x, y, w, h) in faces :

        pillowImage = Image.fromarray(frame[y:y+h, x:x+w])

        #Resizing dimensions

        resizedHeight = 300

        resizedWidth = 300

        ######

        faceCropped = np.array(pillowImage.resize((resizedHeight, resizedWidth), Image.ANTIALIAS))

        start\_time = time.time()

        encoded = face\_recognition.face\_encodings(faceCropped)

        print("--- Encoding time: %s seconds ---" % (time.time() - start\_time))

        if(not len(encoded) == 0):

            # Keras neural net

            npratios = []

            npratios.append(encoded[0])

            npratios = np.array(npratios)

            start\_time = time.time()

            kerasOutput = model.predict(npratios)

            print("--- Detection time: %s seconds ---" % (time.time() - start\_time))

            print("\nKERAS O/P: {}".format(kerasOutput))

            maxValue = kerasOutput[0][0]

            for value in kerasOutput[0]:

                if(maxValue < value):

                    maxValue = value

            if(maxValue == kerasOutput[0][0] and maxValue > 0.99):

                print("\nCONFIDENCE : {}".format(kerasOutput[0][0]\*100))

                exit(0)

    if cv2.waitKey(20) & 0xFF == ord('q') :

        break

video.release()

cv2.destroyAllWindows()

train.py

import cv2

from imutils import face\_utils

import numpy as np

import argparse

import imutils

import dlib

import math

from PIL import Image

from subprocess import call

import os

import array

import simplejson

import face\_recognition

import tensorflow as tf

from tensorflow import keras

os.environ['TF\_CPP\_MIN\_LOG\_LEVEL'] = '2'

#Importing Haar cascade and DLIB's facial landmarks detector

face\_cascade = cv2.CascadeClassifier('haarcascade\_frontalface\_default.xml')

predictor = dlib.shape\_predictor("shape\_predictor\_68\_face\_landmarks.dat")

# Start video capture (webcam)

video = cv2.VideoCapture(0)

#Set name of new user

currentUser = raw\_input("Enter name of current user : ")

masterValues = []

while(True) :

    ret, frame = video.read()

    cv2.imshow('Original video feed', frame)

    #Convert the frame to grayscale

    grayFrame = cv2.cvtColor(frame, cv2.COLOR\_BGR2GRAY)

    #Activating Haar cascade classifier to detect faces

    faces = face\_cascade.detectMultiScale(grayFrame, scaleFactor = 1.5, minNeighbors = 5)

    for(x, y, w, h) in faces :

        #Cropping and resizing face area

        pillowImage = Image.fromarray(frame[y:y+h, x:x+w])

        #Resizing dimensions

        resizedHeight = 300

        resizedWidth = 300

        faceCropped = np.array(pillowImage.resize((resizedHeight, resizedWidth), Image.ANTIALIAS))

        tempEcodings = face\_recognition.face\_encodings(faceCropped)

        masterValues.append(np.array(tempEcodings[0]).tolist())

        ratiosToProcess = []

        temp = [[-0.16058756411075592, 0.0636807307600975, 0.0376606360077858, -0.03935481980443001, -0.010114511474967003, -0.11132754385471344, 0.05779705569148064, -0.060473907738924026, 0.11178746819496155, -0.05231789872050285, 0.10880276560783386, -0.012334633618593216, -0.22565817832946777, -0.07567988336086273, 0.03127690404653549, 0.11884500831365585, -0.12214721739292145, -0.22875449061393738, -0.06762215495109558, -0.11021792143583298, 0.0243105199187994, 0.030992601066827774, -0.08911500871181488, 0.0506906658411026, -0.09754867851734161, -0.25768935680389404, -0.052521687000989914, -0.07753703743219376, 0.0048594726249575615, -0.05942101776599884, -0.04012541100382805, 0.10334717482328415, -0.15507593750953674, -0.05693257972598076, 0.06525803357362747, 0.15494456887245178, -0.017113853245973587, -0.03649125620722771, 0.1909250020980835, 0.04157409444451332, -0.16166916489601135, -0.06808726489543915, 0.07826981693506241, 0.3523993492126465, 0.1654338240623474, 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            ratiosToProcess.append(x)

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            ratiosToProcess.append(x)

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            ratiosToProcess.append(x)

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        for x in temp:

            ratiosToProcess.append(x)

        indicesToProcess = []

        for x in range(1, 21):

            if(x <= 5):

                indicesToProcess.append([0])

            elif(x > 5 and x <= 10):

                indicesToProcess.append([1])

            elif(x > 10 and x <= 15):

                indicesToProcess.append([2])

            else:

                indicesToProcess.append([3])

        print(indicesToProcess)

        X = np.array(ratiosToProcess)

        y = np.array(indicesToProcess)

        model = keras.Sequential()

        class EarlyStoppingByLossVal(keras.callbacks.Callback):

            def \_\_init\_\_(self, monitor='loss', value=0.000001, verbose=0):

                super(keras.callbacks.Callback, self).\_\_init\_\_()

                self.monitor = monitor

                self.value = value

                self.verbose = verbose

            def on\_epoch\_end(self, epoch, logs={}):

                current = logs.get(self.monitor)

                    if current is None:

                    print("Early stopping requires %s available!" % self.monitor)

                    exit()

                if current < self.value:

                    if self.verbose > 0:

                        print("Epoch %05d: early stopping THR" % epoch)

                    self.model.stop\_training = True

        earlyStop = [EarlyStoppingByLossVal()]

        model.add(keras.layers.Dense(200, input\_dim=128, activation='relu'))

        model.add(keras.layers.Dense(100, activation='relu'))

        model.add(keras.layers.Dense(50, activation='relu'))

        model.add(keras.layers.Dense(4, activation='softmax'))

        model.compile(loss='sparse\_categorical\_crossentropy', optimizer='adam')

        model.fit(X, y, batch\_size=1, epochs=100000, callbacks=earlyStop)

        model.save(currentUser + '.model')

        exit(0)

    if cv2.waitKey(20) & 0xFF == ord('q') :

        break

video.release()

cv2.destroyAllWindows()