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Face Recognition Based Attendance System

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Abstract: *Face recognition-based attendance systems will likely replace traditional attendance systems in classrooms in the near future; they may even replace biometric attendance systems. The goal of our project is to create a new attendance system based on cv2. Face recognition technology is used by Facebook, which tags the names of faces when you submit photographs that have already been tagged by you. The algorithm recognizes and encodes the unique traits of the faces in the database into a pattern image. Python modules are then used to find the person's name using a machine learning approach called a classifier. The steps of the operation are image capture, facial features, face recognition, and an attendance system.*

Keywords: Face Recognition

I. Introduction

Face recognition is accomplished in this paper using Python. Initially, all of the faces are photographed and a folder is created. Each image is assigned a name. The database is ready after facial features are identified. Once the database is complete, the camera is utilized to take attendance, and the camera's output is combined with a database for face identification and recognition. The result of face detection and recognition is printed immediately after the program has been performed. A separate Excel sheet with names, present, absent, date, and time details can also be created using another program loop.

II. Face Recognition and Attendance Project Review

The Viola and Jones algorithm is employed, as well as Principles analysis. The initial step is to recognize and detect the face, after which the classifier program compares the faces to a database of students' faces.

In this study of face detection, the optical flow field method is used; it uses objects, which is a relatively recent method for recognition and detection. For the student attendance system, a portable gadget is designed and constructed. The gadget must be developed and optimized for the camera, as well as the server and other hardware.

Face recognition has been established using a filtering method based on Euclidean distances derived using three face recognition techniques: Eigenfaces, Fisherfaces, and Local binary pattern. Automated attendance management system, as well as strategies for dealing with threats such as spoofing.

The performance, efficiency, and accuracy of a new type of touchless attendance system are being researched. The efficiency is determined by the hardware used and the quality of the data collected. The development and study of a touchless attendance system for institutes or classrooms is underway.

Face detection is the topic of this study, and it is utilized for classroom attendance utilizing Discrete Wavelet Transforms (DWT) and Discrete Cosine Transforms (DCT). Facial feature extraction is simple using this method.

When acquired by a high-definition camera and then submitted to a classifier software, the Deep Learning algorithm aids in the detection of faces in the classroom. Face detection students are included in the study, and the system is based on CNN views and algorithms.

III. Methodology

The biometric features of the person are compared with the database templates created at the time of enrollment of all the people in the biometric attendance process. The following procedural stages might be utilized to categorize the approach used in our study.

3.1 Software Installations and Technical Specifications

A high-resolution camera for use in the classroom. Image databases are stored on SSD memory. A computer having a high-performance graphics card. The cost of attending this event

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Attendance System with Face Recognition The biggest cost of using the Cv2 471 system is the cost of gear such as a computer and a camera. For execution, you will need Windows or Linux software. Face recognition library in development.

3.2 Capture an Image

The images created by the camera are captured using the Python library "OpenCV."

3.3 Deep Learning: Face Detection and Recognition

Nowadays, the camera on a Smartphone also contains a face detection feature, which, if observed correctly, is utilized to focus on and capture faces. Facebook, for example, makes advantage of the face detection feature. If we submit the group photo to Facebook, the faces in the photos will be automatically labeled if and only if you have already tagged those faces with names. Facebook uses machine learning to remember and detect those tag names. For face recognition, this library uses the feature base technique. The nose, brows, and lips are among the facial features that are utilized. For each individual, the shape of these facial features varies.

The algorithm matches the image captured by the camera with these pattern images in databases, which highlight the special features of the person, and detects the face of the person. This image ensures the detection of the face even if it is slightly tilted/ oriented or in bad light conditions.

The names of the people may then be simply found using basic machine classification algorithms. Face detection and recognition are performed utilizing a Python library constructed using deep learning in our software "Face recognition."

IV. ALGORITHM

```
from final_fns import face_locations, face_encodings, compare_faces, face_distance, markAttendance
from cv2 importVideoCapture, resize,cvtColor,rectangle,putText,imshow,waitKey, COLOR_BGR2RGB,
FONT_HERSHEY_SIMPLEX
import os
from pandas import read_csv
from numpy import argmin
path = "img"
classNames = []
nameList = os.listdir(path)
for img in nameList:
classNames.append(os.path.splitext(img)[0])

# List of encodings od known faces
df = read_csv("Encodings_db.csv")
df.drop(df.columns[[0]], axis = 1, inplace = True)
encodedListKnown=df.values.tolist()
cap = VideoCapture(0)
while True: #video is a just a large no. of images
success, img = cap.read()
#reducing the size of image bcz its real time
imgSmall = resize(img, (0,0), None, 0.25, 0.25)
imgSmall = cvtColor(imgSmall, COLOR_BGR2RGB)

#finding the encoding of the image from the webcam:-
#there might be multiple faces so we removed the [0] after it as then it would have only taken the first location
camFaceLocs = face_locations(imgSmall)
#similarly here we are giving camFaceLocs, the face location as argument for encodings
camFaceEncodings = face_encodings(imgSmall, camFaceLocs)
```

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```
#finding the matches
#first we will iterate through all the faces found in the cam
for encodeFace, faceLoc in zip(camFaceEncodings, camFaceLocs):
matches = compare_faces(encodedListKnown, encodeFace)
faceDist = face_distance(encodedListKnown, encodeFace)
matchIndex = argmin(faceDist)
if matches[matchIndex]:
name = classNames[matchIndex].upper()
#print(name)
#to show box in webcam with name
y1,x2,y2,x1 = faceLoc
#multiplying the location coordinates by 4 bcz be derived them for scaled down image
y1, x2, y2, x1 =y1*4,x2*4,y2*4,x1*4
rectangle(img,(x1,y1),(x2,y2),(0,255,0),2)
```

VI. Result and Discussion

"Openpyxl" is the library that was used to get the output in an excel sheet. It's a Python library that lets you express data in an Excel sheet.

A single person's attendance is sampled. A database is created for people, one named Kalyani. Figure 1 shows the input of the web camera. Figure 2 shows the output in an excel sheet generated by a Python programme. The screenshot of the excel sheet indicates who is present, who is absent, as well as the date and time the attendance was taken. The program's efficiency is 90%, therefore it can be utilised for practical purposes.

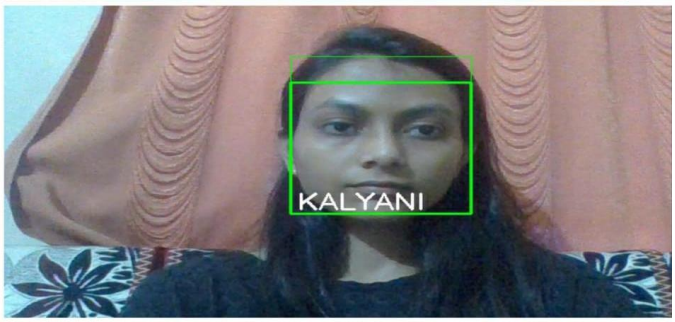

Figure 1: Input to the webcam

	A	B	C	D	E	F	G	H	I	J
1	Name	Time								
2										
3										
4										
5										
6	KALYANI	11:23:15								
7										
8										
9										
10										
11										
12										
13										
14										

Figure 2: Output as an attendance sheet

VII. Conclusion

When acquired by a high-definition camera and then submitted to a classifier software, the Deep Learning algorithm aids in the detection of faces in the classroom. The work's future scope could include fine-tuning the system to detect proxy attendance. Cloud integration is also possible.

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REFERENCES

[1]. Samet R, Tanriverdi M (2017) Face recognition-based mobile automatic classroom attendance management system. In: 2017 international conference on cyberworlds (CW). Chester, pp 253–256. https://doi.org/10.1109/CW.2017.34

[2]. Bhattacharya S, Nainala GS, Das P, Routray A (2018) Smart attendance monitoring system (SAMS): a face recognition-based attendance system for classroom environment. In: IEEE 18th international conference on advanced learning technologies (ICALT). Mumbai, pp 358–360.

[3]. https://doi.org/10.1109/ICALT.2018.00090 Bao W, Li H, Li N, Jiang W (2009) A liveness detection method for face recognition based on optical flow field. In: International conference on image analysis and signal processing. Taizhou, pp 233–236. https://doi.org/10.1109/IASP.2009.5054589