FACE RECOGNITION ATTENDANCE SYSTEM BASED ON REAL-TIME VIDEO PROCESSING

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ABSTRACT

Now a days almost all the colleges try to collect attendance based on either manual or some bio metric ways. So it is becoming a lot of effort to take all the attendance and maintain them. Hence in this application we try to take attendance based on real time video sequence by collecting the student face from web camera and then check with database and find out whether he is present or absent for that day.

1. INTRODUCTION

In this era of Internet explosion, computer technology has involved many areas of people's lives and work. The occasions where people come into contact with computers are gradually expanding. The frequency with which people use computing is also increasing. One of the most challenging projects in the field has a broad application prospect because of its huge sense of innovation. As an important identity label for people to distinguish different individuals, face recognition technology has gradually entered people's lives. Face recognition is the combination of artificial intelligence and computer. Because of its huge challenging innovation and broad application prospects, it has become the most challenging topic in this field.

In recent years, the face recognition application system has developed rapidly as a computer security technology in the world, especially today, when terrorist activities are rampant, this technology has received more and more attention. Face recognition technology has many typical applications in the field of public safety, civil economy, and home entertainment [1-2]. The pipeline of general enterprises needs to record the attendance of personnel, which
has become a basic requirement of the company. However, when these attendance systems are formulated, unnecessary errors often occur. Taking the current fingerprint attendance system as an example, the study has found that the fingerprint attendance system has an error rate of about 5%, and there will be a phenomenon that fingerprints cannot be hit, which seriously affects the efficiency of attendance, especially in large attendance sites, which is more likely to cause congestion. Uniqueness or individuality of an individual is his face. In this project face of an individual is used for the purpose of attendance making automatically. Attendance of the student is very important for every college, universities and school. Conventional methodology for taking attendance is by calling the name or roll number of the student and the attendance is recorded. Time consumption for this purpose is an important point of concern. Assume that the duration for one subject is around 60 minutes or 1 hour & to record attendance takes 5 to 10 minutes.

There are some automatic attendances making system which are currently used by much institution. One of such system is biometric technique. Although it is automatic and a step ahead of traditional method it fails to meet the time constraint. The student has to wait in queue for giving attendance, which is time taking. This project introduces an involuntary attendance marking system, devoid of any kind of interference with the normal teaching procedure. The system can be also implemented during exam sessions or in other teaching activities where attendance is highly essential. This system eliminates classical student identification such as calling name of the student, or checking respective identification cards of the student, which can not only interfere with the ongoing teaching process, but also can be stressful for students during examination sessions. This project introduces an involuntary attendance marking system, devoid of any kind of interference with the normal teaching procedure. The system can be also implemented during exam sessions or in other teaching activities where attendance is highly essential. This system eliminates classical student identification such as calling name of the student, or checking respective identification cards of the student, which can not only interfere with the ongoing teaching process, but also can be stressful for students during examination sessions.

2. LITERATURE SURVEY

INTRODUCTION

Literature survey is the most important step in software development process. Before developing the tool, it is necessary to determine the time factor, economy and company strength. Once these things are satisfied, then next steps are to determine which operating system and language used for developing the tool. Once the programmers start building the tool, the programmers need lot of external support. This support obtained from senior programmers, from book or from websites. Before building the system the above consideration r taken into account for developing the proposed system.
RELATED WORK

During this pandemic, Children have become independent and due to this the parental involvement has decreased. Teachers have started using various platforms such as Microsoft Teams, Google Meet, Zoom Meets. But, the drawback to this is that this remains between only the teacher and student. Presentee are recorded by teachers w.r.t to Real-time detection which is not known to parents that they are attending or not. The main aim is to make students understand about the importance of presence in lectures on daily basis. There is a huge increase in the usage of mobile phones since 2013 and most of students utilize mobiles in wrong way by playing games, using social media, etc. So, to cover most of the population in India we chose to build a mobile application.

<table>
<thead>
<tr>
<th>NAME OF APPLICATION</th>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
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</thead>
<tbody>
<tr>
<td>GOOGLE MEET</td>
<td>Ease of use</td>
<td>Highly competitive market</td>
</tr>
<tr>
<td></td>
<td>Connectivity and Collaboration</td>
<td>Losing Ads</td>
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<td></td>
<td>Accessibility</td>
<td>Regulations restricting Operations</td>
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<tr>
<td></td>
<td>Market Leader</td>
<td>Product Imitation and Counterfeiting</td>
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</table>

(1) Face recognition

Face recognition is the core of the entire recognition process. Face recognition is a computer vision technology that analyzes facial feature information for identity identification. In a broad sense, face recognition is divided into two parts:

1. Face detection and
2. Face recognition matching.

Face recognition technology is based on the facial features of the person, and the input face image or video stream. First determine whether there is a human face, if there is a human face, and then further give the position, size of each face and the position information of each major facial organ. Based on this information, the identity features contained in each face are further extracted and compared with known faces to identify the identity of each face [8-9]. Face recognition technology belongs to biometric recognition technology, which mainly includes four parts: face image collection, face image pre-processing, face image feature extraction, matching and combining hard recognition, combined with hardware cameras, network lines and computing device. The calculation method is as follows

\[ T = \min\{T_1, T_2, \ldots, T_n\} \]
This Technology is a kind of biometrics technology, through the acquisition of camera equipment face information and pre-processing. Face detection. The main purpose of face detection is to collect information to determine whether there is a human face image in the image, and to determine the size and position of the image, and segment the detected human face image into the adult face area. The last link is face recognition, extracting facial feature information and image information to determine whether it is in the repository. If it is, it has matching identity information, otherwise there will be no recognition results.

3. EXISTING SYSTEM

In the existing system almost all the attendance is taken based on manual approach and hence it is very difficult for the end users to maintain all the students information in separate papers. The following are the limitations of current attendance management system.

LIMITATION OF EXISTING SYSTEM

The following are the limitation of existing system. They are as follows:

1) Lot of manual effort to take attendance

2) There was a lot of records to be maintained for storing the data in paper or books.

3) It is more expensive to maintain

4. PROPOSED SYSTEM

In this application we try to take attendance based on real time video sequence by collecting the student face from web camera and then check with database and find out whether he is present or absent for that day. Here we try to apply Haar Classifier to predict the face and then check the student face with already data which is available in the database.

ADVANTAGES OF THE PROPOSED SYSTEM

The following are the advantages of the proposed system. They are as follows:

1. It is more effective

2. It is very efficient

3. It is cost effective

4. There is a backup for the data

5. Reports can be generated very easily
Less time to take attendance

5. SOFTWARE PROJECT MODULES

The application is divided into two modules.

1) Registration Module
2) Login & Take attendance module

5.1 REGISTRATION MODULE

In the registration module the student will enter all his/her basic details like name, regd no, department, year and so on. After entering all the basic details, the application will ask the student to capture his/her image for identification. Once the user image is captured, it is stored into the database.

5.2 LOGIN AND TAKE ATTENDANCE MODULE

Once registration is completed, all the student details are stored into the database. Now the student wants to take attendance on appropriate day. He will click on the take attendance module and then the application will open the web camera and ask to take the student’s picture. Once the student takes his picture, the application will verify the input with the database and then tell if there are any records matched with the database. If there is any record matched, the corresponding attendance is stored into the excel sheet.

6. RESULTS (OUTPUT SCREENS)

MAIN WINDOW

Face Pixels are Stored
import cv2
import os

# Set video width and height
height = 480
width = 640

# Set the face detection cascade
face_detector = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')

# For each person, enter one numeric face id (must enter number start from 1), then press 'enter' 
face_id = input('
Enter user id end press <return> ==> ')

print('
[INFO] Initializing face capture. Look the camera and wait ...')

# Initialize individual sampling face count
count = 0

# Start detecting your face and take 30 pictures
while(True):
    ret, img = cam.read()
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    faces = face_detector.detectMultiScale(gray, 1.3, 5)
    for (x, y, w, h) in faces:
        cv2.rectangle(img, (x,y), (x+w,y+h), (255,0,0), 2)
        count += 1
        filename = dataset + '/User.' + str(face_id) + '.' + str(count) + '.jpg
        cv2.imwrite(filename, gray[y:y+h, x:x+w])
    k = cv2.waitKey(100) & 0xff
    if k == 27:
        break
    elif count >= 30:
        break
        # Take 30 face sample and stop video

print('
[INFO] Exiting program

FACE VALUES ARE STORED IN SEPARATE FOLDER

[Image: Faces from dataset]
### STUDENT DETAILS ARE SAVED INTO EXCEL SHEET

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SERIAL NO.</td>
<td>ID</td>
<td>NAME</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>7</td>
<td>Praveen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>8</td>
<td>Suresh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>3</td>
<td>1</td>
<td>Soosai</td>
<td></td>
<td></td>
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### ATTENDANCE RECORDED IN SEPARATE EXCEL SHEET

<table>
<thead>
<tr>
<th></th>
<th>A</th>
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<th>J</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Id</td>
<td>Name</td>
<td>Date</td>
<td></td>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td>Suri</td>
<td>25-07-2021</td>
<td></td>
<td>20:46:13</td>
<td></td>
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</tbody>
</table>
7. CONCLUSION

Thus, the aim of this project is to capture the video of the students, convert it into frames, relate it with the database to ensure their presence or absence, mark attendance to the particular student to maintain the record. The Automated Classroom Attendance System helps in increasing the accuracy and speed ultimately achieve the high-precision real-time attendance to meet the need for automatic classroom evaluation. Automated Attendance System can be implemented in larger areas like in a seminar hall where it helps in sensing the presence of many people. • Sometimes the poor lighting condition of the classroom may affect image quality which indirectly degrades system performance, this can be overcome in the latter stage by improving the quality of the video or by using some algorithms

8. REFERENCES


