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Face Recognition Based Attendance Record System

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Abstract: ***In today's world, face recognition is the type of biometric that is used in almost every field. This technology is used for security purposes and can be used in many verification and security system. Though it is less efficient than eyes recognition and fingerprint recognition, is still in market due to its untouchability and non-intrusive method. Besides, face recognition should also be utilized for attendance checking in schools, colleges, offices, etc. Face Recognition method pivot to build up a class attendance system which uses the idea of face recognition as present hand done attendance process is lethargic and not suitable to keep. And there are chances of too much proxy attendance. Thus, the want for this method is much needed. This method involves 4 stages- database introduction, face detection, face recognition, attendance updation. The database is made by taking the snap shots of the students in elegance. Face detection and popularity is done using python opencv. Attendance is to be exported at the end of semester.***

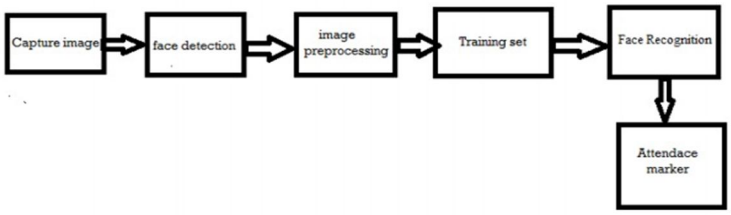
Keywords: ***Face Recognition based attendance system, Face detection attendance system, Face detection system, Face recognition, Attendance by Face detection system***

I. INTRODUCTION

Face is used as a one of the biometric identification parts of a human. Everyone has different Facial Features and stores them as a biometric print to uniquely identify the person. The traditional method of Attendance is very time taking and a burden on the faculties and in the current covid time, it is also not safe to touch a surface that is touched by many others. Other biometric methods have higher chances of spreading the coronavirus. Face Recognition Based Attendance system is totally contact-less method. Face Recognition is widely used in Phones and in other security systems to lock and unlock a particular system. This is implemented by many websites/apps like Whatsapp, Instagram and it helps in also Crime investigation. Face Recognition is also works from some short distance without any contact with the other person. So, there is no need to come near to the biometric system to activate and mark your attendance. In this type of system, there is no chance of false attendance or proxy. It works in two parts: Capture and verification. It compares the stored image with the image which is captured by the camera. If a person's identity totally matches then it will proceed further. Face Recognition works on the 1:1 Matching process. The research shows that there is so much improvement in the Face Biometric system in the last 10 years. There is a huge development in Face Recognition. Now it is working on the different programming languages and much easy to develop a Face Recognition system because of the lots of resources present.
Attendance system based on Face Recognition. Here the face of a person works as an identity. It will be matched and verified by the system by the data of the person already stored in the system. If it will perfectly match it will mark attendance and store it in the database. It will take less time and data will be properly stored in a proper format. Stored data can be extracted into an excel sheet.

II. SYSTEM DESIGN

The system proposed on the basis of face recognition. When a student comes across the camera module, then his/her image/photo will be captured and recognize with validation. When recognition and validation are succeeded, then his/her attendance will mark automatically. In this system, the user gets a login interface to interact with the system. If login is succeeded in the system, the interface displays the home page of the proposed system. The proposed block diagram of the automatic attendance the system is shown in Fig. 1.The system block diagram and explained as follows.



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1) *Capturing the Image*: The camera will place at the entrance of the classroom to get student's face images perfectly. Then it goes to the further process of face detection.
2) *Face Detection*: This part implements face detection, which helps to determine captured images with the location and sizes of student's faces. The image will be captured from detected faces using a haar cascade classifier.
3) *Image Preprocessing*: There is a preprocessing requirement to enhance the input image to improve the quality of the image. We convert input image to greyscale image using color to grey image conversion technique.
4) *Training Set*: Comparing the faces which are to be recognized with other faces in the Data Record for the recognition process. Algorithm faces in the training set tell which person is who. When we recognize face by algorithm, it uses the training set to make recognition.
5) *Attendance Marker*: The particular student will be marked as present when a face from the particular date folder is verified. That is, collect the data of all students who are present in the class, and the rest of the students who belongs to the class will be marked as absent. This is the following procedure.

III.WORK WE DID

After reading the related technologies related to the Face Recognition system and considering their pros and cons. We came up with the idea of using Camera and the Python Programming Language, SQL, and OpenCV library. By Using Python and its OpenCV library, we are basically developing a system that will capture person images in frames and convert it into Grey Scale Image and verify with the data stored in the system.

In every session

All the student's data will be maintained in the Excel sheet and it will be exported into a .csv file anytime. There are different columns of information like StudentId, Name, Email, and Attendance date wise. On this project by using the GSM module, we can add a feature like whenever any student is absent in the school/college. After all the classes, the system will send a message to their parents that their child is absent on a particular class or day. Also, this record of students can be used in exam-related issues.

IV.PROGRAMMING LANGUAGE AND ALGORITHM USED

In this system we have used the python programming language, Sql and Python OpenCV library.

Python is a significant level, deciphered, intuitive, and object-oriented prearranging language. Python is intended to be profoundly discernible. It utilizes English watchwords regularly whereas all other programming languages use punctuation, and it has fewer grammatical developments than different programming languages.

SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database.

SQL is the standard language for Relational Database System. All the Relational Database Management Systems (RDMS) like MySQL, MS Access, Oracle, Sybase, Informix, Postgres and SQL Server use SQL as their standard database language.

1) *Step 1:* Image will captured by the camera
2) *Step 2:* Captured image is converted into grey scale
3) *Step 3:* Face will be verified with the past record
4) *Step 4:* If record is matched with the record saved in the system. “Present” marked on the data sheet.
5) *Step 5:* If the face is not matched with any record. It will show unknown.
6) *Step 6:* Student’s who are not present will be marked “Absent”
7) *Step 7:* Generating report
8) *Step 8:* Update attendance
9) *Step 9:* Back to step 4 and start matching other records
10) *Step 10:* Break and stop the system

V. CONCLUSION

The aim behind face based attendance system is to make less-time taking and automatic system. It is more accurate and there is very less chance to error and proxy. There is no other physical interaction between faculty and student, it will automatically take attendance via face. It will recognize and verify the entry with the record already stored in the system. If it will match, it will mark as “present” and update the record in the excel sheet.

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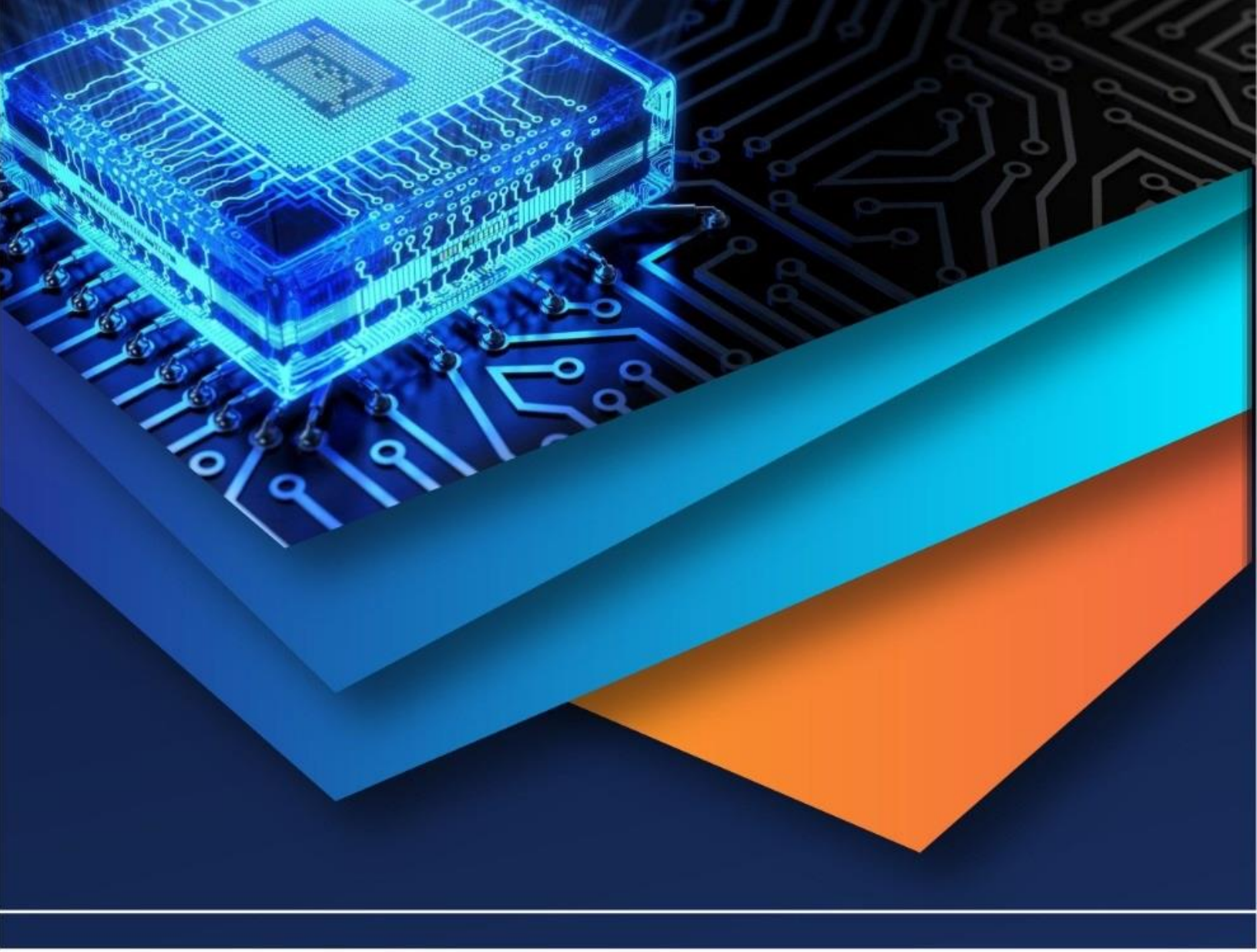
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