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A REVIEW ON: FACE RECOGNITION BASED ATTENDANCE SYSTEM

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Abstract:- Face recognition system plays a crucial part in nearly all sectors in current digital age. One of the mainly used biometrics is facial recognition. It may be used for security, authentication, ID and has many more advantages. It is frequently utilized due to its contactless and noninvasive method, despite its low accuracy in comparison to iris identification and fingerprint recognition. Face recognition technology also can be utilized in schools, schools, offices, etc. For attendance markings. This system intends to provide a class attendance system that employs the concept of face recognition, since it takes time and is difficult to maintain existing manual attendance systems. And proxy attendance opportunities may exist. Therefore, there is a greater requirement for this system. The system consists of four phases: the construction of databases, facial detection, facial identification and attendance. The database is built by the class pictures of the kids. The hair-cascade classifier and the Local Binary Pattern Histogram algorithms are the means for facial detection and recognition. Faces from the live video of the classroom are discovered and recognized. At the end of the session, the attendance will be sent to the corresponding faculty.

Keywords— face recognition, face recognition based attendance system

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I INTRODUCTION

The 21st century is a modern and scientific era in which much progress has been made to accelerate people's performance. The usage of computer technology has now become an intrinsic aspect of life in support of the aforementioned assertion. In pyramids of applications that range from simple to complex problem solving methodologies, computers are used. Face recognition technology has developed as an important instrument among these contributions to recognize the characteristics of faces by its intrinsic characteristics. The field of pattern recognition and computer vision was one of the most researched. Due to its wide use in many different applications such as biometrics, safety of information, control of access by law enforcement, monitoring system and smart cards, however. But for the researcher, it has numerous obstacles to tackle. Face of an item, which are important features, depends on facial expressions. Invariance, enlightenment and aging, for example, represent possible areas which require deeper study of prior work. The results of prior research show that facial expressions change as far as aging is concerned; they could therefore not be represented forever in terms of face recognition. The challenge of facial recognition can be divided into two basic phases: 1) facial verification and

2) Facial identification. In a real-time system, for example, face testing recognizes the same individual in the scene and the person who is in the scene. It locates a face in an image in the first phase. It also takes elements from a discriminate picture in the second step However, there is a lack of dependability in several present authenticating recognition systems. For example, smart cards, wallets, keys, tokens use incredibly difficult to remember PINs and passwords. Moreover, such passwords and codes can easily be forgotten, and even robbs or reproduces such magnetic cards. That's why they are unreadable. They cannot be robbed, forgotten or misplaced contrary to the biological features and attributes of the individual.

Recently, a major target in intelligent cities is to develop biometric applications, such as facial recognition. Moreover, many scientists and engineers worldwide have been engaged on creating more and more robust and precise algorithms and procedures for such systems and their everyday implementation. All sorts of security systems have all personal information to safeguard. The type of recognition used most often is the password. However, many systems are beginning to incorporate various biometric characteristics for recognizing tasks through the development of information technologies and security algorithms. These biometric parameters allow the identification of people by physiological or behavioral properties. They also have various benefits, e.g. the presence of a person in front of the sensor is sufficient and several passwords or confidential codes no longer need to be remembered. A large number of recognition systems based on diverse biometric variables have been deployed in recent years, such as iris, fingerprints, voice and face. Systems which

identify persons based on their biology are particularly desirable as they are straightforward to use. There are several structures and traits of the human face. That is why it has become one of the most extensively utilized biometric authentication methods in recent years because of its promise in many different industries and applications (surveillance, home security, border control, and so on). Consumers outside phones, such airport check-Ins, Sport Stadiums and concerts, are already provided with the facial recognition technology as an ID (identification). Moreover, this technology does not require people to intervene, which allows simply photos obtained from the camera to identify individuals. Many biometric systems created utilizing various search techniques also provide good identifying precision. However, new biometric techniques for facial recognition to achieve real time restrictions would be intriguing.

II. LITERATURE REVIEW

Akash Singh et. all (2021) The facial recognition automatic support system is simple, precise and efficient. The system runs automatically once the administration has created each student record. Some algorithms that can perceive appearance must be used to improve system performance and recognition precision. The face depicts the identity of a person. Authors therefore have developed a facial recognition-based, automatic student support system. In everyday applications, the system is very useful in security and monitoring systems. Airport security systems use face recognition for suspects and facial recognition is used for the conduct of criminal investigations by the CBI and the FBI. [1]

Debadrita Ghosh (2021) Automatic support is provided by the system. Time savings and high security have been proven by using these technologies. Unknown people can also be identified. A technology for the improvement of recognition rates is future extraction. The system has only developed facial recognition of 30 degrees, which needs further improvement. An inadequate illumination classroom can influence the image and insufficient clarity indirectly reduces system performance. One of the key advantages of facial recognition methods among all biometric technologies is that it is simpler to use and more accurate than other methods of implementation. The world of today has undergone tremendous changes in almost all ways with the increase in technologies and scientific knowledge. In nearly every corner of the world it plays a very important rôle in technical facilities, machine learning, algorithms etc. [2]

Dr. Asif Ali et. all (2021) Authors method allows individuals to be identified by comparing the images from pictures in a folder. With this model, the faces of students can be recognized and their attendance marked automatically in real time without any manual intervention. we can improve the viability of the model by renting cloud storage details. The traditional system consists of teachers' records, which may lead to human mistakes and extensive maintenance. Time consumption is an important problem in this system. [3]

Ankur Singh Bist et. all (2020) Signy Advanced Technologies has made a breakthrough in the area of artificial intelligence with AttendX's artificial intelligence design that records student attendance data that are deemed able to prevent attendance fraud. There are 49 people in this trial, including seventeen men and 32 women, in the 13-day AttendX 1.28 test from 5-18 August 2020. Of the 1,000 participants chosen, 1,764 participated. The success rate reached 56 percent of 882 mask absenteeism trials. The success rate was 79 percent in 882 trials without a mask. Correct men represented 78 percent in 612 trials, and 77 percent of women in 1,152 trials. A total of 1764 tests have been carried out, 1202, with a precision rate of 68%. The ending is quite large to wear a mask rather than wear a mask. There is still a relatively large error between men and women. There is a significant difference between using a mask and not wearing a mask, and between men and women there is no substantial difference. [4]

Samiksha Malhotra1 et. all (2020) The technology works as a smart system which prevents manual errors and decreases workload. It works better because it is totally automated. This method focuses on eliminating traditional logbooks, RFID-based systems or biometric fingerprinting. Many intelligent systems have been designed using a variety of approaches and methods, therefore it can be concluded that hair like qualities are most suited to the system since it takes less time for the model. It takes longer. Facial detection and recognition are the most frequent functions in machine learning (ML) (DL). These functions are common in camera monitoring, mobile telephone safety and in other domains. This article proposes a college attendance system, based on the above functions, that will automatically mark student attendance rates via feedback in real time. In the classroom, CCTV cameras. [5]

Soumitra Chowdhury et. all (2020) Perform automatic scoring and storage of classrooms. The process includes entry of student data, training data, face-recognition and automatic help. The model CNN used in this study can detect and identify an individual through facial features, even when they don't look at the camera directly. With an exactness of approximately 92 percent, the proposed system can detect and identify students. You save teachers time and trouble by automatically dialling up and storing the current student participation rate. In order to be most efficient,

the system must provide each individual during the training period with a consistent and satisfactory number of images. [6]

Aparna K S et. all (2020) In placing the webcam in the classroom, the method proposed relies on the recognition to identify the images of the student based on facial characteristics and attendance. The precision of the system for recognizing images of students is 84%. Authors recognize faces in outdoor environments in the future. It is possible to implement this facial recognition system on mobile devices. It is a time-consuming task to attend classes in real time. When monitoring attendance manually, teachers encounter many problems. The manual assistance system takes time; attendance takes only approximately 10 minutes. [7]

Payal Chaudhari et. all (2020) The management system for facial recognition seeks to solve problems already present in the existing handling systems. Security of databases and datasets is very important to avoid attendance by agents. Manual support can be removed and time saved. Since the system has nothing to affect, it also removes the risk of the spread of bacteria. Because of Covid-19, all organizations are required to observe social separation by the government. When such a device is installed on campus, we can ensure that social distance across the campus is respected. The attendance management system can scoring and analyzing activities on a daily basis while reducing manual intervention. [8]

Rupali Satpute et. all (2020) Explain how the projects are using techniques and methods. Finally, the findings and how they were resolved are displayed and then discussed. Haar-Cascades have a very good effect for face detection. The video speed in real time without obvious frame delay is satisfactory, even if the subject wears glass or has a beard or some other facial feature. The combination of LBPH and Haar-Cascades as a cost-effective platform for facial recognition can be considered extensively. An example is a system where known revolvers can be identified in shopping malls or supermarkets in order to warn owners to be alert or to start classes automatically. It is collected and saved in the memory, and by different algorithms and techniques students will be identified. [9]

Dr. R.S. Sabeenian et. all (2020) The project was finished to be more intelligently involved. A deep learning algorithm is Mobile Face net. The accuracy of the marking faces in a given data set is 85% and the accuracy of marking faces in a given data set is up to 90%. This helps managers reduce the manual attendance time and replace the system of RFID cards with the corresponding identities assigned to each student. The possibility of losing the card therefore does not affect the attendance of the student and of false attendance will be reduced to a minimum. Therefore, if the model is put into practise in real life the organization will help to manage participation and prevent foreigners from entering the organization. The proposed solution consists in developing a systemic working model to encourage the support system in the classroom by identifying students' faces from classroom photographs. [10].

III. SYSTEM BLOCK DIAGRAM

3.1 Face Recognition

The process of face recognition can be split into three steps Prepare training data, face recognizer train, forecast. The photos in the dataset will be the training data here. They are assigned with the student's integer label. These pictures are then utilized to recognize the face. The Local Binary Pattern Histogram is the face recognizer employed in this system. The Local Binary Patterns list of whole faces (LBPs) is initially obtained. These LBPs are transformed into decimal numbers and all these decimal values are written into histograms. At the conclusion, for each image in the training data a histogram will be created. Later on, the histogram of the face is calculated during the recognition process and then the best matching label of the student to which it belongs is compared with the already calculated histograms and returned.

3.2 Attendance Updation

After face recognition process, the recognized faces will be marked as present in the excel sheet and the rest will be marked as absent and the list of absentees will be mailed to the respective faculties. Faculties will be updated with monthly attendance sheet at the end of every month.

3.3 Face detection and recognition

The face detection and identification module identifies faces from the camera image and saves the image on the face. The module detects the images of the face of the student that are manually recorded in the database using their names and identification codes. In the database are recorded facial detection data and facial recognition data.

3.4 Programming Language:

There are bindings in Python, Java and MATLAB/OCTAVE. The API for these interfaces can be found in the online documentation. Wrappers in other languages such as C#, Perl, Ch, Haskell, and Ruby have been developed to encourage adoption by a wider audience. Since version 3.4, OpenCV.js is a JavaScript binding for selected subset of OpenCV functions for the web platform.

3.5 Operating System Support:

All of the new developments and algorithms in OpenCV runs on the following desktop operating systems: Windows, Linux, macOS,

FreeBSD, NetBSD, OpenBSD. OpenCV runs on the following mobile operating systems: Android, iOS, Maemo, BlackBerry 10. The user can get official releases from SourceForge or take the latest sources from GitHub. OpenCV uses CMake.

3.6 General Flow of the Proposed Approach (Recognition Part)

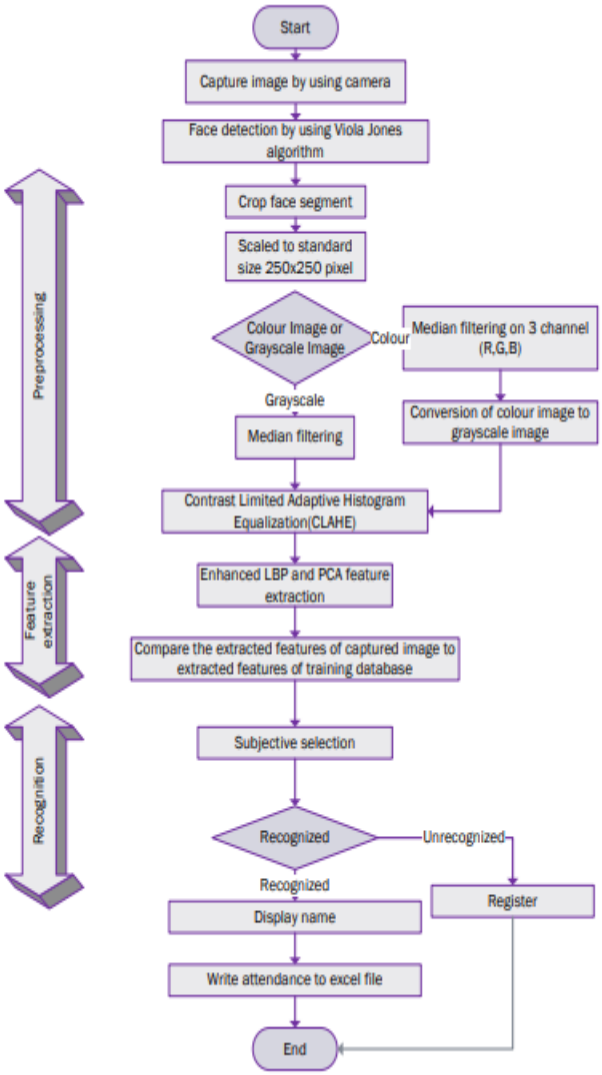

Figure: 1 General Flow Chart for Recognition

IV. CONCLUSION

4.1 Conclusion

Face recognition research has been a long-standing area for scientists. There are numerous known facial recognition algorithms, which can be used in comparison to trained facial images to classify the provided facial image. The literature review shows how Haar Cascade is dependable in all publications, given that it provides a high rate of detection, whereas LBPH beats alternative algorithms with a higher rate of recognition and a low fake rate. The usual procedures are lit, act, enhance, because of the exactness of the face detection and the recognition of certain degradation, which afterwards link the requirements of application in order to provide deep learning with the help of the neural network.

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