ICEST-2K24 [International Conference on Engineering, Science and Technology]
In Association with
International Journal of Scientific Research in Science, Engineering and Technology
Print ISSN - 2395-1990 | Online ISSN : 2394-4099 (www.ijsrset.com)

Student High Definition Monitoring Face Recognition Smart Attendance System

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ABSTRACT

Today's educational institutions are worried about students' consistent performance. The insufficient attendance is one factor contributing to the decline in student performance. The most popular techniques to record your attendance are to sign or call the pupils. It was problematic and took longer. A computer-based student attendance monitoring system that enables the teacher to maintain attendance records is now essential. In this paper, we used an intelligent attendance system based on face recognition.

In this paper it involves student's facial recognition smart attendance system .it is different from traditional old way of marking attendance instead of giving decay time for attendance we can use this method to saving paper work and time of teacher and students not worry about to missing their Attendance rather a calling their roll no one by one just time taking process. In this paper attendance automatically taken and automatically mark on Excel sheet. And also student database and teacher database also include to help teachers to categorize the attendance subject wiseand teacher database help teacher to login and logout with their respective subject and teacher have proper access this platform.

Keywords: Face Recognition, LBPH(Local Binary Pattern Histogram) Algorithm, Haar Cascade Algorithm.

I. INTRODUCTION

Every organization requires a robust and stable system to record the attendance of their students. and every organization have their own method to do so, some are taking attendance manually with a sheet of paper by calling their names during lecture hours and some have adopted biometrics system such as fingerprint, RFID card reader, Iris system to mark the attendance. The conventional method of calling the names of students manually is time consuming event. The RFID card system, each student assigns a card with their corresponding identity but there is chance of card loss or unauthorized person may misuse the card for fake attendance. While in other biometrics such as finger print, iris or voice recognition, they all have their own flaws and also they are not 100% accurate. Use of face recognition for the purpose of attendance marking is the smart way of attendance management system. Face recognition is more accurate and faster technique among other techniques and reduces chance of proxy attendance. Face recognition provide passive identification that is a person which is to be identified does not to need to take any action for its identity. Face recognition

involves two steps, first step involves the detection of faces and second step consist of identification of those detected face images with the existing database. There are number of face detection and recognition methods introduced. Face recognition works either in form of appearance based which covers the features of whole face or feature based which covers the geometricfeature like eyes, nose, eye brows, and cheeks to recognize the face.

II. LITERATURE SURVEY

According to Harsh Kumar, NishantBhati, PiyushBharadwaj,PratyushChoudhary, Ms.Akansha Sharma "Real Time Face Attendance System Using Face Recognition"2023 The technique used to solve the problem of inefficient and inaccurate attendance systems is the implementation of a real timeface recognition attendance system using deep learning algorithms. This system utilizes deep learning models, such as MobileFaceNet,for face detection and recognition. The face detection is performed using the ultra-light face detector model, while the face recognition is achieved using the MobileFaceNet.[1]

According to RohiniVhatkar, AnasShaikh, QadriHasan, Prof. Dinesh Deore. "Attendance Management System Using Face Recognition."2023 The technique used to solve the existing problem of attendance management is the development of an Attendance Management System using Machine Learning specifically face recognition technology.This system automates the attendance process by using biometric techniques to detect and recognize faces.[2]

According PayalPatil, Prof. Dr. S. Shinde, "Comparative analysis of facial recognition models using video for real time attendance monitoring system"2020Attendance reporting is one of the standard processes across the world in academic institutions. The key purpose is to encourage consistency in attending school which in turn improves the learning process for a student. The manual attendance system is widely used in the educational system which is time-consuming as well as laborious. The main concept behind the automatic attendance system is to apply facial recognition effortlessly compared to other biometric systems.[3]

According to Maria Ali, Hafiz UsmanZahoor, Ans Ali. "Smart Multiple Attendance System through Single Image", 2020In this system, a group image is captured from a high-resolution camera mounted at a fixed location to capture the group image for all the students sitting in a classroom. Next, the face images are extracted from the group image using a popular Viola-Jones algorithm followed by recognition using a convolutional neural network trained on the face database of students. We tested our system for different types of group images and types of databases.[4]

According to DrArunaBhat, ShivamRustagi, Shivi R Purwaha, ShubhangSinghal, "Deep-learning based group photo Attendance System using One Shot Learning",2020face recognition-based attendance system which can work with group photo of a class providing us a list of present students. It uses one shot learning based face recognition technique for our system which can work for new users by providing only a single image of them thus making the system very robust and efficient. The proposed work presents a fully functional android app and backend system architecture which can easily be utilized by any university or school without requiring any expensive infrastructure setup.[5]

According Naman Gupta, Purushottam Sharma, Vikas Deep, Vinod Kumar Shukla,"Automated Attendance System Using OpenCV"The technique used to solve the problemof inefficient and inaccurate manual attendance systems is image processing, specifically face recognition. This technique involves capturing and analysing images of students' faces to accurately detect and mark their attendance.[6]

According to SoumitraChowdhury, SudiptaNath,AshimDey and Annesha Das.“Development of an Automatic Class Attendance System using CNN-based Face Recognition”,2020 This paper represents the development of a face recognition based automatic student attendance system using Convolutional Neural Networks which includes data entry, dataset training, face recognition and attendance entry. The system can detect and recognize multiple person’s face from video stream and automatically record daily attendance.[7]

According to SamridhiDev, TusharPatnaik, “Student Attendance System using Face Recognition”, 2020 The technique used to solve the existing problem of efficient and accurate attendance management in educational institutions is the implementation of a realtime attendance system. This system utilizes algorithms such as K-nearest neighbor (KNN), convolutional neural networks (CNN), and support vec- tor machine (SVM) for face recognition and attendance marking.[8]

According to ArjunRaj.A, Arvind K, Chethan KS, Mohammed Soheb, “Face recognition based smart attendance system”2020 The image is enhanced using histogram equalization and inputted into face detection algorithms like Deep Neural Network (DNN). The LBPH Algorithm is used to recognize students' faces, cropping them for features like eye distance and nose distance. Students are marked present or absent based on these features, and their identification is recorded in a database.[9]

According to Radhika C. Damale, Prof.Bageshree. V.Pathak “Face Recognition Based Attendance System Using Machine Learning Algorithms, 2018 paper proposes a face recognition system using machine learning algorithms such as SVM, MLP and CNN. The system achieves good accuracy on a self-generated database but suggests improvements like using a better-quality webcam and expanding the dataset for better real-time performance.[10]

III.PROBLEM STATEMENT

To design and develop a student high definition monitoring face recognition smart attendance system.

IV. PROPOSED SYSTEM

Here in this section we have cover the detailed information of proposed system. Here we will see objectives of proposed system along with architecture, hardware and software requirements, algorithm, applications.

V. ARCHITECTURE

Following Figure represents Architecture of our proposed system

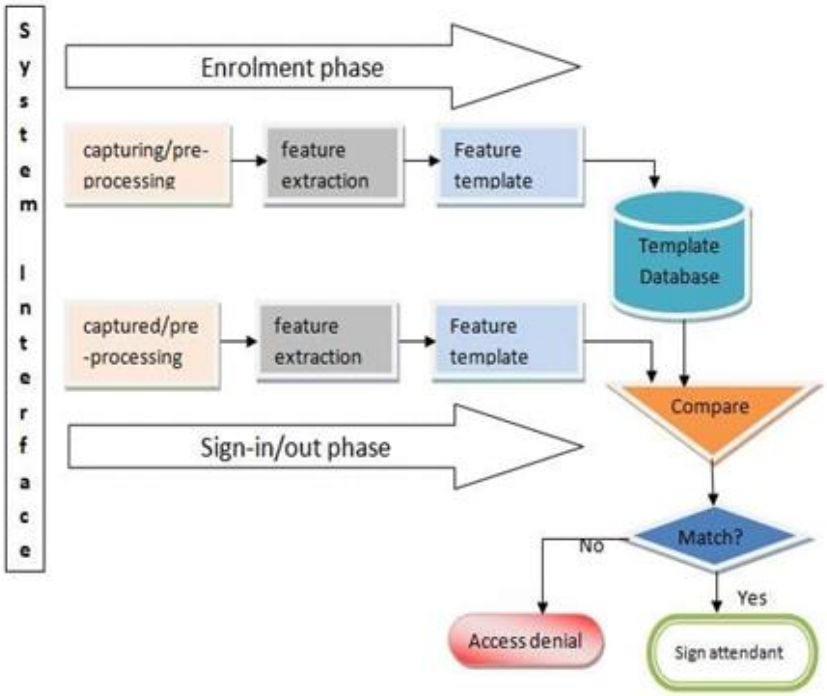

Fig.1. Architecture of face detection attendance system

The image you've shared is a flowchart representing the architecture of a biometric security system interface. It's divided into two main phases: the "Enrolment phase" and the "Sign-in/out phase". Here's a breakdown of the flowchart:

Enrolment Phase:

1. **Capturing/Pre-processing**: The system captures and preprocesses the biometric data (in this case, likely a facial image or fingerprint).
2. **Feature Extraction**: The system extracts unique features from the pre-processed data.
3. **Feature Template**: The system creates a feature template from the extracted features and stores it in the Template Database.

Sign-in/out Phase:

1. **Capturing/Pre-processing**: The system captures and pre-processes the biometric data of the person trying to sign in or out.
2. **Feature Extraction**: The system extracts feature from the pre-processed data.
3. **Feature Template**: The system creates a feature template from the extracted features.
4. **Compare**: The system compares the newly created feature template with the templates in the database.
5. **Match?** If there's a match, the system signs the attendant in or out. If there's no match, access is denied.

This architecture is commonly used in biometric security systems for access control or attendance tracking. It ensures that only enrolled individuals can sign in or out, enhancing the security of the system. Please note that the actual implementation may vary based on specific requirements and technologies used.

VI. OBJECTIVE

The objective of implementing a face recognition smart attendance system is to improve efficiency and accuracy in attendance tracking by leveraging advanced technology.

This system aims to automate the process, reduce manual errors, enhance security, and provide valuable data for better management and analysis of attendance records.

VII. ALGORITHM

- The use of facial data raises privacy issues and may infringe on individuals' rights, leading to concerns about data security and misuse.
- Face recognition systems can struggle with variations in lighting conditions and facial poses, reducing their accuracy in real-world environments.
- Implementing these systems on a large scale can be complex and costly, requiring significant hardware and infrastructure.
- Face recognition systems are susceptible to spoofing attacks, where a photo or video of an authorized person can be used to gain access.
- High computational and memory requirements can limit the practicality of deploying face recognition systems on resource-constrained devices.

VIII. RESULT &DISCUSSION

The student high definition monitoring face recognition smart attendance system discussed in the paper successfully addresses the issue of inefficient attendance monitoring in educational institutions by using face recognition technology to automatically mark attendance. The system is designed with specific hardware and software requirements, including a processor, RAM, operating system, and database.

The system functions well in various positions and variants, effectively marking each student's attendance using facial recognition technology. However, the paper also highlights limitations that need to be addressed for future improvements. These limitations include occasional struggles in identifying pupils at a distance and certain processing limitations. To enhance the system's performance, it may be beneficial to utilize a system with more processing power[1].

Overall, while the student high-definition monitoring face recognition smart attendance system shows promise in improving attendance monitoring processes in educational institutions, there is room for enhancement in terms of performance and functionality. Future improvements could focus on addressing the identified limitations to further optimize the system's efficiency and accuracy in marking attendance [1].

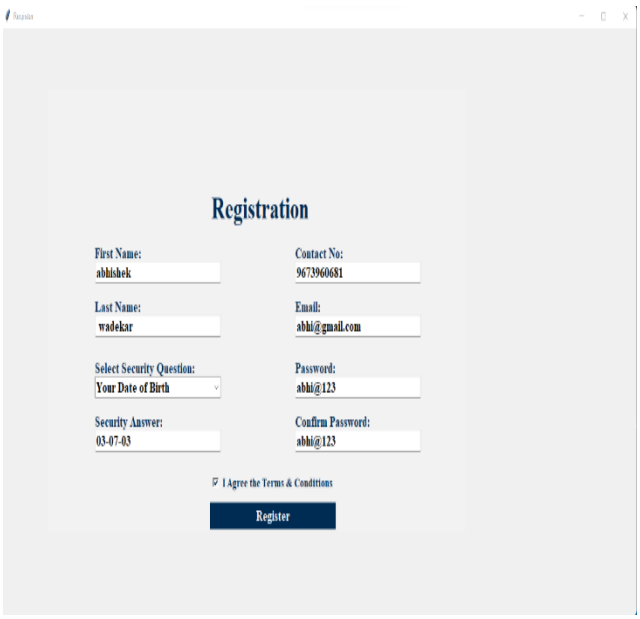

Fig: - registration page

This is registrantion page there is not login any one thye are registrantion first

fig: -login page

In this page the parson is login form

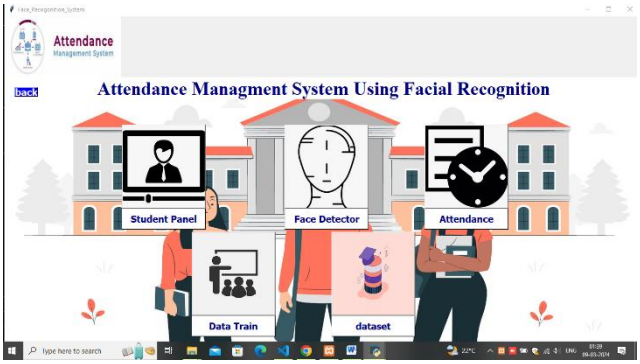

fig: feature

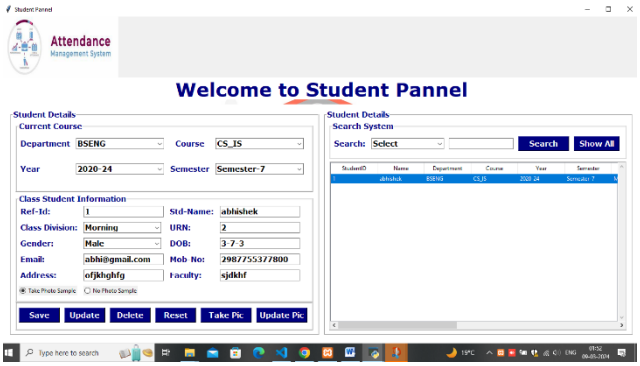

Fig: - information of Students

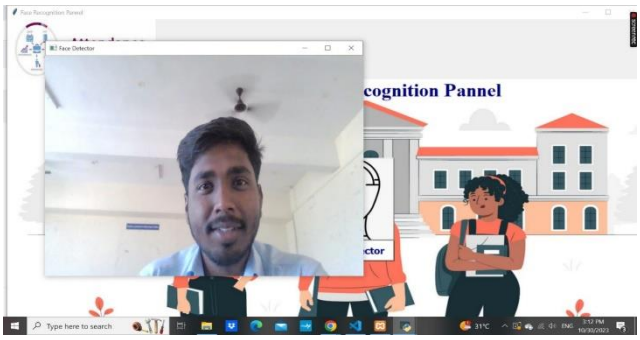

Fig: - train data base

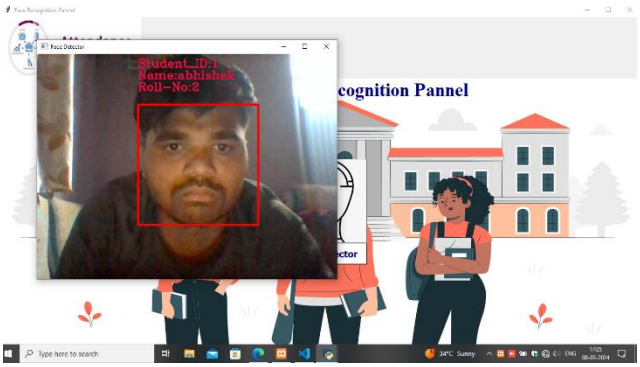

Fig: -detection of face with name and roll no

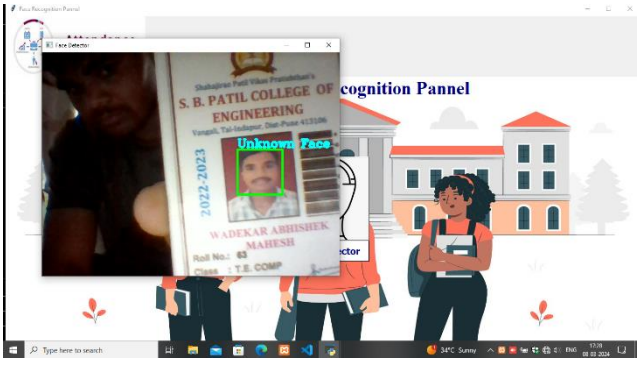

Fig :- 2d image not respond

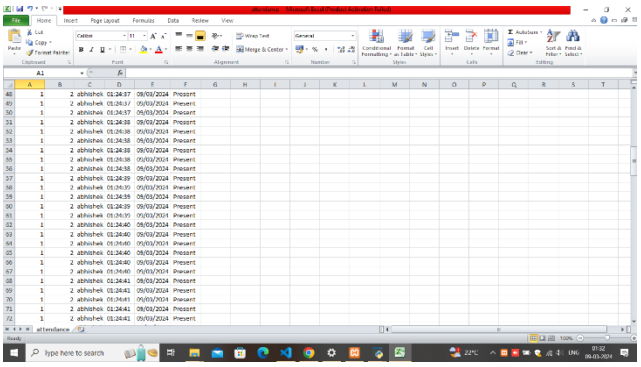

Fig: - Mark Attendance in excel sheet

IX. CONCLUSION

The problems with the current manual systems are addressed by the smart attendance management system. To improve the system and mark each student's attendance, we applied the facial recognition approach. The device functions admirably in various positions and variants. Future improvements to this system are required because it occasionally struggles to identify pupils at a distance. Additionally, there are certain processing limitations, so using a system with more processing power may help this system perform even better

X. REFERENCES

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