International Journal of Innovative Research in Engineering
Volume 3, Issue 6 (November-December 2022), PP: 08-10.
www.theijire.com **ISSN No: 2582-8746**

Real-Time Smart Attendance Management System

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How to cite this paper:
Mahibalan K[1], Madhan M[2], Karpaga Vinayak K[3], "Real-Time Smart Attendance Management System", IJIRE-V3I06-08-10.

Abstract: *Attendance is a routine that is followed every hour of every day. The frequent attendance of students is crucial to performance assessment and quality control in the current academic system. Most institutions still use traditional, risky, and time- consuming methods of addressing or signing documents. If attendance is managed manually, it can be a tremendous strain for teachers. A manual attendance system can now be implemented utilizing computer vision thanks to advancements in technology. Torecognize students' facial features for automated paper-and-pencil attendance, computer vision is crucial. Automation is used to handle this attendance properly and over time. Teachers, students, and parents have access to attendance at any time and from any location. Processing of images. It is time-consuming and expensive to easily evaluate attendance using image processing with deep learning. To address the COVID issue, the system also offers temperature control and hand sanitization capabilities.*

Key Word*: Machine learning, face detection, and face recognition.*

I. INTRODUCTION

Every hour of every day, a practice called attendance is maintained. Regular attendance is crucial for performance assessment and quality control in the current educational system. In most institutions, names are given or documents are signed, which is a very time-consuming and uncertain practice. If attendance is managed manually, it can be a tremendous strain for teachers. A manual attendance system can now be implemented utilizing computer vision thanks to advancements in technology. Computer vision is crucial in student facial identification for automated attendance taking that doesn't require paper and a pen. Automation is used to effectively and permanently handle this traffic. Teachers, students, and parents have access to attendance at any time and from any location. A clever response to the discourse of many contemporary wants for empathy andreinforcement of identity claims has arisen in the form of facial recognition. In the context of student attendance, face confirmation is a crucial field for authentication purposes. The application of a digital attendance system record is the main goal of this project. It is challenging to control the existing system of keeping track of attendance through records. To solve theCOVID-19 problem, the system also does temperature monitoring and hand sanitization.

A. Face recognition based on distances and dimensions.

The solution suggests facial recognition-based mobile attendance management, which is adaptable and usable anytime, anywhere. The system operates in real-time with the aid of a clever, user-friendly device that helps keep the cost of the system's equipment down. Teachers and students make up the user part. a guardian who enables real-time attendance monitoring. This reduces the time and money required to take attendance under a traditional manual system. Face recognition for attendance is the major objective of this technology. There are two ways to recognize faces: feature-based face recognition and appearance-based face recognition. It recognizes facial features like the nose, eyes, and so on based on features. But appearance is determined by distance and size. The authors employed filtering based on Custom Faces, Fisher Faces, and LBP-calculated Euclidean distances in this system (Local Binary Pattern). When the distance between the face and the camera is increased to demonstrate the constraint, the system fails.

B. Feature-extracted face recognition

Face-detection features are supported by this system. In a classroom, participation is a ritual that requires time and money for the technology needed to track attendance. To avoid disturbing students, the system recommends that attendance be collected during regular classes using a video recording. The video first goes through the process of face detection and then feature extraction. The research also includes estimations of the student position, image size, resolution, and brightness. After a thorough facial recognition assessment, deep learning is used to apply attendance to the student. Depending on whether the environment is more light- or dark-lit, this system can occasionally fail to distinguish a face.

C. Face recognition method with Eigen Face and PCA

For face recognition, several methods are available, including the Eigen face, PCA, and LDA hybrid algorithms. The proposed facial recognition-based automated attendance system is an excellent example of how to evaluate student presence in the classroom. Additionally, this method aids in thwarting fraudulent traffic and proxy odds. Many methods use biometrics that

is available in the modern world. However, due to its great accuracy and need for little to no human involvement, facial recognition is proving to be a practical solution. The system's goal is to offer a high level of security. Therefore, it is necessary to create a highly efficient class attendance system that can simultaneously recognize several faces. Additionally, it doesn't require any specialized hardware to be implemented. A smart attendance system can be set up with just a camera, computer, and database servers.

D. Classification of face features using Mahalanobis's technique

The use of algorithms for converting 2D photos into 3D models that are stored in a database for face recognition. This study uses a 2D to 3D development strategy to examine face recognition. As feature extraction techniques, Convolutional Neural Networks (CNN) and PCA are utilized in image reconstruction models. A 3D face image is produced from a 2D facial image using the CNN method. The suggested facial recognition-based attendance system can be successfully implemented using the Mahalanobis approach for classification and the PCA method for feature extraction. The suggested technique has a high accuracy of up to 98% for facial recognition.

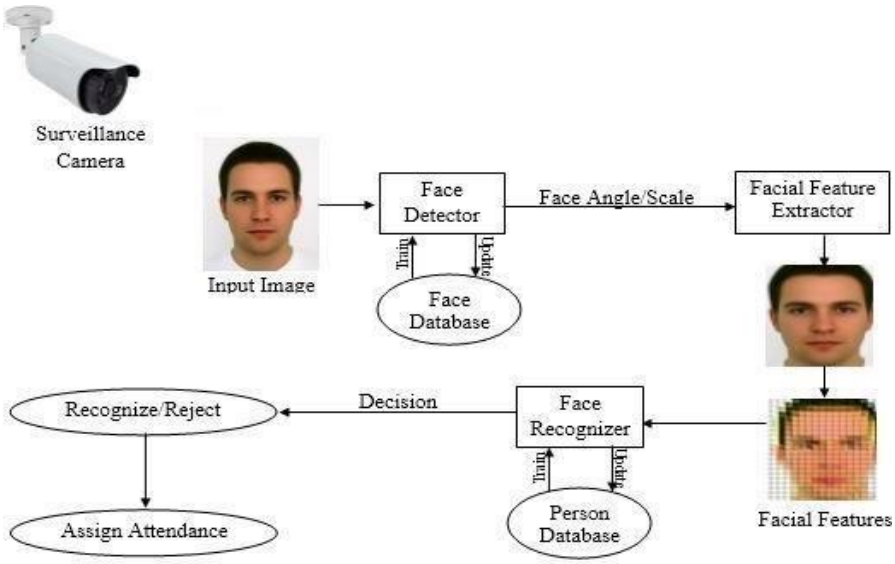
E. Single face identification using multi-scale feature extraction

Face recognition's hot yet challenging problem at the moment is single-face pattern recognition. Existing approaches choose reliable features or create virtual samples to address this issue. The research suggests multi-scale support for the vector-based transform (MSSVT) approach for creating multidimensional virtual samples for one picture recognition by taking into account robust feature selection and concurrent virtual sample generation. Two sorts of problem-solving techniques are distinguished. One is to look for certain features that, in terms of feature selection, are robust to the number of samples, for example, PCA and 2DPCA. However, because the feature extraction technique can only extract a small amount of feature data from eachface, the performance of face recognition would suffer. The second is to increase the number of virtual samples produced from an extended viewpoint sample, lessening the effect of sample size.

F. A face recognition technique based on feature fusion and sparse representation

The authors provide a sparse representation-based multi-feature fusion face recognition technique. The core concept is to find sparsity through training, utilize the sparse coefficient and training samples to represent the test samples, and then solve the l1- norm issue to get the best sparse solution. Under no occlusion or occlusion situations, feature fusion approaches produce higher recognition results than any single feature algorithm. Our system can still get a good recognition rate even when there are fewer than 10 photos in each category of persons in the training sample and the occlusion type is uncontrollable.

II.SYSTEM ARCHITECTURE



III.MODULES

Automated student attendance is made possible by the smart attendance system. Attendance modules can be defined in the following ways to carry out automation tasks:

1. Admission In this stage, students who are brand-new to the class or institution are enrolled. Step Be informed that the students receive and the database stores basic student information including name, phone number, roll number, class, and section. These facts are details about the student. The student's face is caught in each of the individual camera window shots. The A student database contains images as well as student data. All student photographs that are stored in the database have face recognition done on them.

2. Image capturing when a student enters the classroom, their attendance is recorded according to a smart attendance system.In the classroom, photographs of the children are taken using a camera. To capture photographs of the highest caliber and precision, utilize a decent camera with a high pixel count. The pupils' faces who are present in the classroom are photographed.
3. Image processing the pictures the camera takes are put to use in image processing. Three steps make up image processing: picture pre-processing, face detection, and face recognition.

a) Pre-processing: To make the photos clean, the images are cleaned and de-noised.

b) Face detection: Based on a landmark on a person's face, face detection is carried out. On the person's face, the pre- set 68 landmark points are subjected to the Viola and Jones algorithm. Face tracking and facial landmark detection are performed using face bounding box detection and a constrained local model. The image moves on to the following step once the face has been identified.

c) Face Recognition: Deep learning is used to identify faces. The camera captured the picture. The database's pictures of registered students are compared to the attendance result. Deep learning goes beyond just facial changes and takes into account his quickness and usability.

4. Marking attendance Face recognition effectively enables us to determine a student's attendance and activity in class. By interrupting the camera's use at the start and end of the lecture, you can gauge each student's participation and cut down on proxy.

5. Report: Based on tagged attendance data and a database, a report is generated that can be used to assess student attendance in class. The entire student management system can be subjected to further performance evaluation.

Titled "Finding Opinions on Movie Reviews", Malini R analysed opinions on movie reviews. In general, emotional analysis emphasizes the separation of feelings from substance. Feedback analysis identifies and validates an individual's feelings about a set of substance. Here, the model analysed the right emotion t of the comments in relation to the latest Bolly wood movie reviews. Categorized tweets as positive tweets using SVM and Naïve Bayes. The emotion of each tweet was evaluated as negative or neutral and the results were forecasted based on that.

B. Seref, E. Bostanci, “analysis of the correct emotions using naïve bayes and complement naïve bayes classifier algorithms onhandoop framework,” Int. Symp. on Multidisciplinary Studies and Innovative Technologies, 2018.

IV.CONCLUSION

A smart attendance system is a complicated task with numerous associated subtasks. a review of the usage of facial recognitionin the attendance system as the primary criterion for recording student attendance in the classroom. The technology is the ideal replacement for the manual attendance methods employed 10 years ago. Time and money spent on older equipment are saved. Studies are being done on various facial recognition techniques. Identifying facial traits by statistical means. Others make use of function extraction as their primary method for facial recognition. Results are more accurate when the feature extraction plus classification method is applied.

V.CONFIRMATION

It is not acceptable to number the headings of the References and Acknowledgments sections. The creation of this template would not have been possible without the creation and upkeep of the IEEE LaTeX style files by Michael Shell and other volunteers.

Reference

1. *R. Samet and M. Tanriverdi, "A mobile automatic classroom attendance management system based on facial recognition," in 2017 International Conference on Cyberworlds (CW), Chester, pp. 253-256, DOI: 10.1109/CW.2017.34*
2. *S. Bhattacharya, G.S. Nainala, P. Das, and A. Routray, "Smart Attendance Monitoring System (SAMS): A Face Recognition Based System Attendance System for Classroom Environment," 2018 IEEE 18th International Conference on Advanced Learning Technologies (ICALT),Mumbai, 2018, pp. 358–360.*
3. *"Real-Time Smart Attendance System Using Face Recognition Techniques", 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence), Noida, India, 2019, pp. 522–525; DOI: 10.1109/CONFLUENCE.2019.8776934*
4. *E. Winarno, I. Husni Al Amin, H. Februariyanti, P. W. Adi, W. Hadikurniawatian, and M. T. Anwar, "A Face Recognition Based Attendance System A System Using CNN-PCA Method and Real-time Camera," International Seminar on Information Technology and Intelligent SystemsResearch 2019 (ISRITI), Yogyakarta, Indonesia, 2019, pp. 301-304, DOI: 10.1109/IS*