# Face Recognition Attendance Management System With PowerBI Dashboard

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Abstract- The Oxford Dictionary defines a face as the part of a person's head from the forehead to the chin or the corresponding part of an animal. In human interactions, the face is the most significant factor because it contains important information about an individual. All humans will acknowledge people from their faces. The proposed solution is to develop an operating prototype of a system that may facilitate class attendance management for the lecturers within the lecture rooms by detecting the faces of scholars from an image taken in a classroom.

Keywords- PowerBI, Machine Learning, OpenCV.

## I. INTRODUCTION

Attendance tracking is crucial in educational institutions and workplaces to monitor performance and ensure discipline. Traditional methods like manual roll calls or paper-based registers are time-consuming, error-prone, and susceptible to proxy attendance. While some institutions use biometric systems such as fingerprint or iris scans, this paper proposes a more advanced, contactless solution: a Smart Attendance System based on face recognition technology. This system automates attendance by detecting and verifying faces in real-time using a camera and facial recognition algorithms, storing records in a secure database. It eliminates the need for manual intervention, enhances accuracy, and integrates seamlessly with existing infrastructure, thereby improving institutional efficiency and reducing administrative burden.

The rest of this paper is organized as follows. The next section composes a review of similar researches that have beenimplemented and tested for real time attendance detection. In Section III, the proposed algorithm is described. Thestages of the proposed real time attendance detection algorithm. In Section IV, experimental results are reported.Finally, some conclusions are given and future work is proposed.

## **II. LITERATURE SURVEY**

Literature Survey is most important step in the software development process. Before developing the tool, it is necessary to determine the time factor, economy and company strength. Once these things are satisfied, the next step is to determine which operating system and language can be used in developing the tool.

[1] Face Recognition Based Attendance Marking System by K. Senthamil Selvi, P. Chitrakala, and A. Antony Jenitha, have described the concept to find real-time human faces, for that, Principal Component Analysis has been used to recognize the faces detected with a high accuracy rate. The system consists of a camera that captures the pictures of the worker and sends it to the image enhancement module. Attendance is maintained on the server thus anyone will access it for functions like administration in the institution. On recognizing, the second attendance database contains data concerning the workers, and conjointly uses it to mark attendance. If it's compared to ancient attendance marking, this technique seems to save time and helps to monitor the scholars.

[2] Face Recognition Based Student Attendance System with OpenCV by CH. Vinod Kumar and Dr. K. Raja Kumar, it is suggested that face recognition-based (mostly on student attendance systems) with OpenCV takes the number of individuals present within the classroom and takes attendance of each of them using face detection and recognition techniques. It is efficient for students to recognize which of them are present. In this proposed system faces are detected and recognized using the Eigen object detection algorithm. This is done with the help of OpenCV (CVI) which has face detection present in the OpenCV inbuilt. For this, the system associates HD digital camera is needed to require the input pictures in an exceedingly fastened space wherever the camera is located. The photographs that are taken from the camera are detected with a haar cascade. The frontal faces and eyes are then trained with the Eigen algorithm, the trained faces are stored in a database first, and compared to the trained images after comparing it makes attendance to the recognized persons.

[3] Facial Recognition using OpenCV by Divyarajshin N. Parmar and Brijesh B. Mehta, are to supply a group of detection algorithms which will be later prepackaged in an easily portable framework amongst the various processor architectures we tend to see in machines (computers) nowadays. A way is described in this paper, which supported the way to resize a picture along with keeping its pixel ratio equivalent. It is found that this face detection works well in OpenCV with a classifier, provided by OpenCV. Given a picture, which might come from a file or live video, the detector extracts the known location and classifies it as "Face" or "Not Face." The drawbacks like the image produced being not recognizable in a bright room problem (referred to as "illumination dependent"), and lots of different problems, like the face, ought to be even in a very consistent position are mentioned during this paper.

[4] Smart Attendance Monitoring System by Sudhir Bussa, Shruti Bhanuka, Ananya Mani, and Sakshi Kaushik presents the automated attendance system for convenience or data reliability. The system is developed using OpenCV and focuses components to make this system device for managing the students' attendance using Face Recognition Technology. This system achieves high frame rates working only with the information saved in a single grey-scale image. These alternative sources of information can also be integrated with our system to achieve even higher frame rates.

The literature survey highlights the evolution of attendance management systems, starting from traditional manual methods to biometric solutions and advanced face recognition technologies. Traditional systems, while simple, suffer from inefficiencies and are prone to errors, whereas biometric methods improve accuracy but face limitations such as hygiene concerns and hardware dependency. Face recognition has emerged as a promising alternative due to its contactless and automated nature, supported by advancements in artificial intelligence and machine learning. Despite its advantages, challenges such as varying environmental conditions and privacy concerns remain areas for improvement. The survey underscores the need for a robust, scalable, and efficient system that addresses these challenges, forming the basis for the proposed Smart Attendance System with FaceRecognition.

## III. METHODOLOGY

The methodology of the Face Recognition-Based Attendance Management System with Power BI Dashboard involves a systematic process designed for efficiency, accuracy, and real-time data visualization. Initially, the system captures a live video feed wherein a student's face is detected as they look toward the camera. Advanced image processing techniques are employed to detect and extract the facial region of interest, ensuring that only the relevant portion of the image is processed further. This extracted face is then compared against a pre-trained database of registered student images using face classification algorithms to determine a match. Upon successful recognition, the system marks the student as "Present" and logs the attendance data accordingly; unrecognized faces are considered "Absent." This data is typically stored in a structured, Excel-compatible format, facilitating seamless integration with Power BI. The Power BI dashboard processes this stored data to generate interactive visualizations that offer real-time insights into attendance trends, individual student participation, and class-wide engagement. This integrated approach not only automates and streamlines attendance tracking but also empowers educators and administrators to make informed decisions through comprehensive data analytics.

## Face Recognition-Based Attendance Management System with Power BI Integration

The diagram illustrates the operational workflow of a face recognition attendance system integrated with a Power BI dashboard for reporting and visualization.

- **1.** Face Capture for Attendance: The process begins when a student glances at the camera. The system detects the student's face in real time using a video feed.
- **2.** Face Detection and Extraction: Once detected, the system identifies and extracts the facial region of interest from the frame to ensure precise recognition.
- **3.** Face Classification: The extracted image is classified by comparing it against the pre-trained dataset of registered faces. This step determines whether the face matches any existing records.
- 4. Attendance Marking: If the face is successfully recognized, the student is marked as "Present." Unrecognized faces are left as "Absent." The attendance data is recorded and stored, typically in an Excel-compatible format for further processing.
- 5. Power BI Dashboard Visualization: The stored attendance data is integrated into Power BI, where it is visualized through interactive dashboards. These dashboards provide real-time insights into attendance patterns, student participation, and overall engagement metrics. This system ensures automated, contactless, and efficientattendance tracking while enabling data-driven decisionmaking through comprehensive Power BI reporting.



Figure 1 :Face Recognition-Based Attendance Management System with Power BI Dashboard

## **IV. SNAPSHOTS**



Snapshot 1: Home Page



Snapshot 2: Admin Login Page



**Snapshot 2: Registration Page** 



**Snapshot 4** : Training Images



Snapshot 5 : Face Detection of 3 students



Snapshot 6: Attendance Dashboard in PowerBI

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Snapshot 7: Page showing current day's attendance

### V. CONCLUSION

This System represents a significant advancement in automating and modernizing attendance management processes. By utilizing facial recognition technology, the system ensures high accuracy and reliability while eliminating the inefficiencies of manual methods. Its integration with a centralized database and real-time visualization through Power BI offers a seamless blend of biometric authentication and data analytics. This combination not only simplifies attendance tracking but also provides actionable insights, enabling organizations to monitor and manage attendance patterns effectively. The system's scalability and adaptability make it suitable for various environments, including educational institutions, corporate offices, and large-scale events, proving its utility across diverse domains.

In the real world, this system holds immense importance as it addresses critical challenges such as time consumption, errors, and fraudulent practices in traditional attendance methods. Its ability to automate attendance processes significantly reduces administrative workload, allowing organizations to focus on core activities. The biometric-based authentication strengthens security, ensuring that only authorized individuals are marked present. Additionally, the Power BI dashboard empowers stakeholders with real-time data analysis, aiding in resource planning, policy-making, and performance evaluation. By bridging technology with operational efficiency, the system contributes to smarter, data-driven decision-making and enhances overall productivity in organizations.

### REFERENCES

- [1] Face Recognition Based Attendance Marking System by K. Senthamil Selvi, P. Chitrakala, and A. Antony Jenitha.
- [2] Face Recognition Based Student Attendance System with OpenCV by CH. Vinod Kumar and Dr. K. Raja Kumar.

- [3] Facial Recognition using OpenCV by Divyarajshin N. Parmar and Brijesh B.Mehta.
- [4] Implementation of Automated Attendance System using Face Recognition. Mathana Gopala Krishnan, Balaji, Shyam Babu Guided by: Mr.K.Rajesh AP-II CSE & Supported by: Dr.A.UmaMakeswari AD. International Journal of Scientific & Engineering Research, Volume 6, Issue 3, March-2015, ISSN 2229-5518
- [5] Facial Recognition Attendance System Using Python and OpenCv Dr. V Suresh, Srinivasa Chakravarthi Dumpa, Chiranjeevi Deepak Vankayala, HaneeshaAduri, Jayasree Rapa, Quest Journals Journal of Software Engineering and Simulation Volume 5 Issue 2 (2019) pp: 18-29 ISSN(Online) :2321-3795 ISSN (Print):2321-3809
- [6] Development of Rea1 Time Face Recognition System Using OpenCV D. Mary Prasanna 1, Ch. Ganapathy Reddy 2, International Research Journal of Engineering and Technology (IRJET) eISSN: 2395-0056, p-ISSN: 2395-0072, Volume: 04 Issue: 12 Dec-2017.
- [7] Smart Attendance System using OPENCV based on Facial Recognition by Almer John E. International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181 Vol. 9 Issue 03, March-2021.
- [8] Automated Attendance System Based on Facial Recognition using Viola-Jones Algorithm by N.Dhana Lakshmi, Pranavi Nagubandi, Muralidhar Yeleti,
- [9] Smart Classroom Attendence System Using Face Recognition and Raspberry Pi by Author information and year of publication Harish G, Aishwarya B.R., Bhadri Narayan S, Smitha Shekar B, and Chinmayeshree K.B 2021.
- [10] Implementation of Face Recognition based Attendance System using LBPH by Author Information and Year of Publication Ajimi.S March-2019.
- [11] Face Recognition Based Attendance Management System Using Machine Learning" by by Anju.