

Live Camera & Facial Recognition-Based Student Monitoring System

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Abstract— Define all symbols used in the abstract. Do not cite references in the abstract. Do not delete the blank line immediately above the abstract.

In the current situation, contactless attendance system using face recognition is an efficient preventive strategy since they allow for a safe and efficient way of marking student entry in and out. In terms of its most recent version, facial recognition technology has made recording student attendance simpler than ever before. A face recognition attendance system automatically identifies and confirms a person and records attendance based on their face detection. The OmniVerse project is a pioneering venture into the world of AI-powered web applications, promising to transform digital content interaction and artificial intelligence engagement. It streamlines content creation, aids creative professionals, and revolutionizes music production. OmniVerse caters to a diverse user base, emphasizing efficiency and innovation, while its precision and user-friendly design make it an indispensable gateway to heightened productivity and boundless creativity, driven by AI-driven text, image, and audio generation features, offering a transformative user experience.

Index Terms— AI, Generative AI, WebApp, Student Identity System, Facial Recognition, Attendance Tracking, Computer Vision

I. INTRODUCTION

The project focuses on the development and implementation of a Live Camera Detection System designed to recognize student faces and verify their identities to monitor their attendance during scheduled classroom lectures. The primary objective was to address the challenge of ensuring punctuality and attendance compliance, with the system automatically triggering notifications to alert absent students on their registered mobile numbers within the lecture designated time slot. The project aimed to modernize attendance management, leverage technology to promote student accountability, and adapt to the ever-

evolving landscape of educational delivery. The system automatically generates notifications or alerts to notify absent students in real-time, reminding them of their missed attendance and potentially prompting them to join the session remotely if possible. The Live Camera Detection System seamlessly integrates with existing classroom infrastructure, minimizing disruption to the teaching and learning environment. Its user-friendly interface ensures easy adoption by both educators and students, facilitating a smooth transition to automated attendance tracking. By leveraging technology to promote student accountability, facilitate real-time monitoring, and generate actionable insights, the project seeks to modernize educational delivery and enhance the learning experience for all stakeholders involved.

II. RESEARCH METHODOLOGY

A. Surveying Existing System

Truein is a cloud-based attendance system that uses facial recognition to track employee attendance. It's designed for businesses, including enterprises, contract workers, and field staff. Truein's facial recognition system is AI-powered and can capture attendance even when employees are wearing masks or in low light conditions. It can also identify people with changes to their facial features, such as a new hairstyle, beard, or glasses. The system is available on Android or iOS devices and doesn't require any complex hardware. Truein's facial recognition system is considered to be nearly 100% accurate. It works by creating a dataset of a person's face and training the system with it. The system then compares the captured image to the stored face print to verify a person's identity. If the face matches, attendance is marked in an Excel sheet for that person. Face recognition is a contactless and paperless technology that allows users

to access and attend by verifying captured images, videos, or identification points from a stored database. If the match occurs, the attendance is marked or authentication is granted. Truein automatically tracks where they are. Geofencing ensures the staff clocks in only at specific locations and prevents them from clocking in when they are out of range. Centralized dashboard offers a real-time view of the multiple clock-ins. Truein uses mobile devices for time and attendance, which is cost-effective and convenient compared to other biometric systems like fingerprint scanners. This is because nearly all smartphones, tablets, and laptops have built-in front-facing cameras, so there's no need for any additional hardware. Additionally, since every employee is already accustomed to using the front-facing camera on their mobile device, there's no need for any training or orientation for work-from-home employees. The staff can clock In/Out even without the internet, and you can continue tracking their attendance. Face recognition and GPS tracking also work without the internet.

B. Objective

The primary objective of a face recognition and attendance system is to automate and streamline the process of recording attendance. The automated attendance-taking process saves time and reduce administrative overhead. By using facial recognition technology, attendance can be recorded quickly and accurately without the need for manual entry or paper-based systems. It provides a convenient and user-friendly attendance recording experience for employees, students, or event attendees. The system's performance include enhanced attendance tracking, timely notifications for absent students, precise data collection, a user-friendly interface for both instructors and students, adaptability to various educational settings, positive student responses, increased administrative efficiency, and the potential for valuable data analysis.

III. PROPOSED SYSTEM

OmniVerse stands out with a powerful array of features, each leveraging advanced machine learning algorithms to enhance user experiences in various domains:

Text and Code Generation: It simplifies content creation and coding tasks with AI-driven capabilities.

It caters to writers, programmers, and professionals by expediting processes like drafting articles, generating code snippets, and automating repetitive assignments. By leveraging AI, it ensures high-quality output efficiently.

Image Generation: Designed for designers and photographers, this feature enables users to effortlessly generate images, perform intricate image segmentation, and make real-time edits. It streamlines graphic design processes, catering to various needs such as marketing visuals, photo editing, and experimentation with image segmentation.

Audio Generation: It revolutionizes music production by allowing musicians and producers to create unique and experimental audio compositions through digital synthesis. This feature drives innovation in the industry, stimulating experimentation, the evolution of new music genres, and democratizing the art of music creation.

Reference: Mohd. Ashfaq, Wael Shaikh, Badreen Jaffer. OmniVerse: Local On-Device Multi AI System and Live Student Monitoring via Facial Recognition. *International Journal of Computer Applications*. 185, 48 (Dec 2023)

Live Student Monitoring via Facial Recognition: The project integrates advanced facial recognition technology into the educational environment to streamline attendance management processes. By automating the identification of students during classroom lectures, the system minimizes administrative burden and reduces the potential for errors associated with manual attendance tracking. It focuses on the development and implementation of a Live Camera Detection System designed to recognize student faces and verify their identities to monitor their attendance during scheduled classroom lectures. The primary objective was to address the challenge of ensuring punctuality and attendance compliance, with the system automatically triggering notifications to alert absent students on their registered mobile numbers within the lecture designated time slot. In addition to notifying absent students, the system can also trigger notifications to parents or guardians, keeping them informed about their child's attendance and academic engagement. This promotes parental involvement and collaboration in supporting student success. The implementation of real-time notifications ensures immediate communication with absent students, empowering them to take prompt action to

address their absence. This proactive approach not only fosters a sense of responsibility among students but also enhances overall class participation and engagement. The project aimed to modernize attendance management, leverage technology to promote student accountability, and adapt to the ever-evolving landscape of educational delivery.

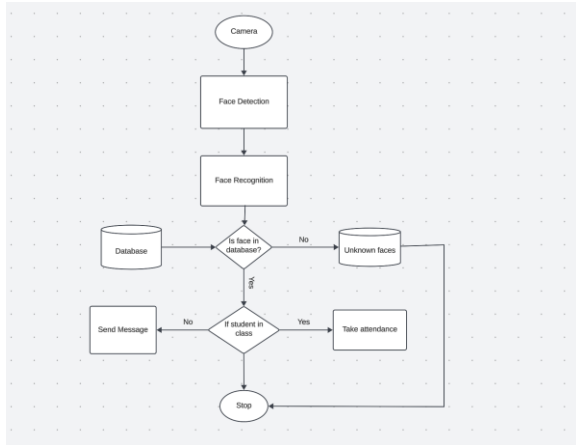


Fig 1. Flowchart of Facial Recognition System

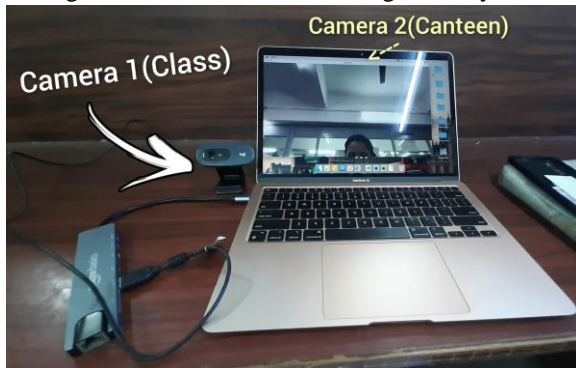


Fig 2. Setup of an internal and external camera

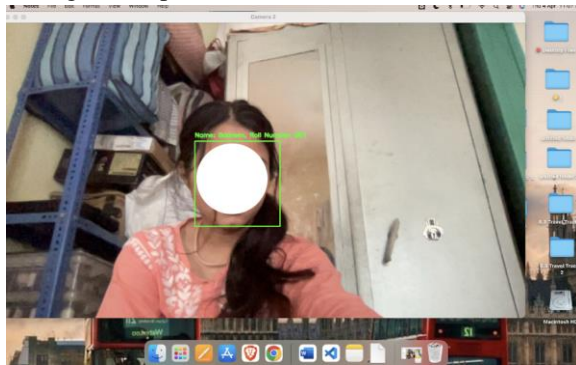


Fig 3. Face Recognition from Live Camera

Name	Roll Number	Time
Badreen	1	2024-04-03 21:37:26

Fig 4. Attendance marked in excel file

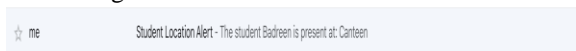


Fig 5. Notification sent via E-mail

IV. METHODOLOGY

The methodology centers around the development and deployment of two distinct systems: OmniVerse, an AI-powered web application with advanced features, and a Live Student Monitoring system that utilizes facial recognition technology to enhance classroom attendance monitoring. The live student monitoring system will require the development of a robust facial recognition system. This will involve creating facial recognition algorithms and integration with camera hardware for real-time detection. Student Identity Verification: In addition to facial recognition, a student identity verification system will be implemented to ensure that the detected face matches the registered student identity. Notification System: For notifying absent students, a notification system will be integrated. This system will send notifications to registered email-ids when students are not present within the designated lecture time slot. To facilitate student identity verification, a centralized database will be established to store student information, including photographs and corresponding identification details. This database will serve as a reference for comparing detected faces with registered student profiles, ensuring accurate identification. A user-friendly interface is designed for both the facial recognition system and the OmniVerse web application. Intuitive interfaces will enhance usability for both students and administrators, facilitating smooth interaction with the system's features. The live student monitoring system will be seamlessly integrated with existing educational management systems, such as student information systems and course scheduling platforms. This integration streamlines administrative workflows and enhances interoperability between different components of the educational ecosystem.

V. CONCLUSION

Attendance tracking using Face Recognition System reduces administrative burden and saves time for both administrators and attendees. The ability to track attendance in real-time enables organizations to monitor attendance patterns promptly and make timely decisions. Students can check-in quickly and easily by simply presenting their faces, eliminating the need for physical badges or keycards. Facial recognition systems are scalable and can track and maintain large

number of students. As educational institutions continue to adapt to the evolving needs of modern classrooms, the implementation of live camera detection and monitoring systems represents a significant step forward in attendance management. By fostering accountability, promoting punctuality, and optimizing administrative workflows, these systems contribute to a dynamic and conducive learning environment conducive to student success.

REFERENCES

- [1] Facial Recognition Attendance System Using Python and OpenCv Dr. V Suresh, Srinivasa Chakravarthi Dumpa, Chiranjeevi Deepak Vankayala, HaneeshaAduri, Jayasree Rapa.
- [2] Computer Vision based Attendance Management System for Students, Mohd Ashfaq, Mohammad Amaan, Mohd Aalam, Mohd Aamir Ullah, Dev Raghav, Anamika Goel.
- [3] Design of Classroom Attendance System Based on Face Recognition, Wenxian Zeng. .
- [4] Convolutional Neural Network Approach for Vision Based Student Recognition System, Nusrat Mubin Aral, Dept. of CSE, SUST, Sylhet, Bangladesh.
- [5] Xin Geng, Zhi-Hua Zhou, & Smith-Miles, K. (2008). Individual Stable Space: An Approach to Face Recognition Under Uncontrolled Conditions. IEEE Transactions on Neural Networks.