

## Abstract

In recent years, the shift to virtual learning environments has posed new challenges for educators in terms of student engagement and attendance management. Traditional attendance tracking methods, such as manual roll calls or quiz-based check-ins, have proven inadequate in ensuring both accuracy and efficiency. To address these challenges, we propose an AI-powered face recognition attendance tracker for virtual learning platforms. This system leverages advanced computer vision algorithms to automatically identify and record the presence of students during live online classes. By integrating facial recognition technology with virtual learning platforms, the proposed solution offers several benefits: **Automation:** The AI system automatically logs attendance as students join the class, reducing administrative workload for teachers. **Accuracy:** The face recognition algorithm provides a highly accurate means of tracking student participation, minimizing the potential for human error or fraudulent attendance. **Real-time Processing:** Students' faces are detected and recorded in real-time, allowing for an immediate and up-to-date attendance record. **Enhanced Security:** With the use of biometric data, the system ensures that only the enrolled student is marked present, preventing proxy attendance. **Seamless Integration:** The solution can be easily integrated into existing learning management systems (LMS), providing a smooth user experience for both educators and students. This research focuses on the development of an efficient, scalable, and secure face recognition-based attendance tracking system tailored for virtual classrooms. We discuss the underlying AI algorithms, the challenges of implementing such a system, and the potential ethical concerns regarding privacy and data protection. The results suggest that this technology could significantly improve attendance tracking in virtual learning environments, enhance teacher-student interaction, and reduce administrative overhead, contributing to a more streamlined and accountable online education experience.