iJETRM
International Journal of Engineering Technology Research & Management
Published By:
https://www.ijetrm.com/

VOICE AND FACE BASED ATTENDANCE USING AI

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ABSTRACT
This study aimed to develop and assess an AI-powered attendance system utilizing both voice and facial recognition technologies to enhance accuracy, security, and efficiency in attendance tracking. Traditional methods such as manual sign-in or ID-based systems often encounter issues like proxy attendance, time fraud, and administrative burden. The proposed system addresses these limitations by integrating artificial intelligence for biometric verification through voice and face recognition. The implementation involves real-time data capture, preprocessing, identity verification, and automatic logging of attendance records. This approach is particularly beneficial in academic institutions, corporate environments, and high-security areas where reliable authentication is critical. The study further explores technical challenges, ethical considerations, and system performance metric**.**

Keywords:
Artificial Intelligence · Attendance System · Face Recognition · Voice Recognition · Biometrics · Identity Verification · Automation · Security · Machine Learning.

INTRODUCTION

Traditional attendance systems are prone to issues such as proxy attendance, time theft, and manual errors, making them inefficient and unreliable. With the emergence of artificial intelligence, biometric technologies like facial and voice recognition provide a more secure and automated solution. This study focuses on developing an AI-based attendance system that combines these two biometric modalities to ensure accurate and real-time user verification. The system is designed for institutions and organizations seeking efficient, secure, and tamper-resistant attendance tracking**.**

OBJECTIVES

This study aims to develop an AI-based attendance system that utilizes both facial and voice recognition for secure and accurate verification. It seeks to provide real-time, automated attendance tracking to reduce manual errors and eliminate proxy attendance. Additionally, the study aims to evaluate the system's performance in terms of accuracy, reliability, and user-friendliness. The overall objective is to offer an efficient and secure solution for attendance monitoring in institutional and organizational settings.

METHODOLOGY

This study employed a developmental research design to create and evaluate an AI-based attendance system integrating facial and voice recognition technologies. The system was developed using Python with machine learning libraries such as OpenCV for face detection and recognition, and speech recognition APIs for voice identification. Data was collected from a sample group of users whose facial images and voice samples were enrolled into the system’s database. System testing was conducted in a controlled environment to measure accuracy, speed, and reliability. Evaluation focused on the system’s ability to correctly identify individuals and record attendance in real time while preventing unauthorized access or proxy attendance.

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Figure 1 Voice and face recognition process

User ID	Time Stamp	Face Match	Voice Match	Attendance Status
001	2025-05-09 09:02:01	Yes	Yes	Present
002	2025-05-09 09:03:17	Yes	No	Rejected
003	2025-05-09 09:04:52	Yes	Yes	Present

RESULTS AND DISCUSSION

The Voice and Face Attendance AI system was tested under varying environmental conditions using a dataset consisting of 100 individuals, each providing both facial images and voice samples. The model was evaluated on parameters such as accuracy, processing time, and robustness to

Geographical Situation. The Voice and Face Attendance AI system is designed to be adaptable and deployable across various geographical regions, both urban and rural, with minimal infrastructure dependency. Its cloud-based backend and low hardware requirements make it suitable for educational institutions, corporate offices, and government sectors across different parts of the country.

ACKNOWLEDGEMENT

We take this opportunity to express our sincere gratitude to all those who supported and guided us throughout the development of our project, *Voice and Face Attendance AI*.
We would like to thank our project supervisor, [Supervisor's Name], for their valuable insights, continuous encouragement, and expert guidance, which greatly contributed to the success of this project.

CONCLUSION

The implementation of the **Voice and Face Attendance AI** system demonstrates the potential of biometric technologies in creating a secure, efficient, and user-friendly attendance solution. By integrating facial recognition and voice authentication, the system ensures dual-factor verification, enhancing accuracy and minimizing the risk of fraudulent entries. The use of advanced deep learning models like CNNs for facial features and speaker embedding for voice recognition allows for reliable identification even under varying environmental conditions.

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