Ai Based Face Recognition Attendance System & RFID Door Lock

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Abstract:- The traditional method of taking attendance has become outdated in this age of rapidly evolving new technologies. The AI-based attendance system is a technological solution that automates the process of taking attendance with high accuracy and efficiency using advanced technologies such as facial recognition, biometrics, and machine learning algorithms.

The system combines various technologies to provide accurate attendance tracking and access control. It includes a door lock that only opens for authorized individuals and an attendance tracking system that uses facial recognition, RFID, and machine learning algorithms to identify and record attendance data of individuals. The facial recognition technology captures images of individuals and trains them using machine learning algorithms, ensuring that only authorized individuals can access the system and have their attendance recorded.

The system also includes RFID technology, which provides access to the premises, and a web portal that allows authorized personnel to check attendance in real-time. The system is highly scalable, customizable, easy to use, and requires minimal training, making it suitable for small and large organizations. In summary, the AI-based attendance system is an innovative solution that provides accurate attendance tracking and access control, ensuring that only authorized individuals have access to the facility. The system is scalable, customizable, easy to use, and requires minimal training, making it a flexible solution for schools, universities, and organizations that require strict access control and efficient attendance tracking.

Keywords:- Local Binary Pattern Histogram(LBPH). Face Detection, Face Recognition, Haarcascade Classifier, Python, StudentAttendance.

I. INTRODUCTION

The advancement of technology has revolutionized the way we live and work. With the help of automation, we can streamline and improve many of our daily tasks, including attendance management. One area that has seen significant development in recent years is the use of AI-based facial recognition systems for attendance management.

The AI-based facial recognition attendance system is a new technological development that offers several advantages over traditional attendance management methods. The system uses advanced algorithms to recognize faces and mark attendance automatically, making it a faster and more efficient way to track employee attendance.

The proposed system includes an RFID-based door lock system, where RFID is used to unlock the door, and an esp32 camera module that continuously live streams and detects faces using the OpenCV module. The attendance information is then stored in an Excel sheet.

The purpose of this research paper is to explore the feasibility and effectiveness of the proposed AI-based facial recognition attendance system with an RFID-based door lock system. The research will investigate the accuracy and reliability of the system in marking attendance, its effectiveness in reducing attendance- related fraud, and its potential to save time and increase productivity.

Facial Recognition can be split into two categories –
➢ Verification
➢ Identification

➢ Verification
Verification is a one-on-one matching process(match or no match). The tool may be used to lock and unlock systems, phones and other electronic devices.

➢ Identification
Identification is a technique for distinguishing an individual within a group of individual such one out of N.

II. LITRATURE SURVEY

Attendance management has always been a crucial aspect of any organization's performance management process. In traditional attendance management systems, employees mark their attendance by signing in a logbook or using a biometric system that captures their fingerprints or iris. However, these methods are not always reliable as they are susceptible to manipulation, resulting in attendance fraud.

To address these challenges, organizations are increasingly turning to AI-based facial recognition systems for attendance management. Facial recognition technology is highly accurate, fast, and can identify people even in low light conditions. The technology works by analyzing facial features, such as the distance between the eyes, nose, and mouth, to create a unique digital signature that can be used to identify individuals. With the addition of an RFID- based door lock system, the proposed AI-based facial recognition attendance system provides an added layer of security. The RFID system ensures that only authorized personnel can access the premises, while the facial recognition system marks attendance automatically.

III. RESEARCH OBJECTIVES

The main objectives of this research paper are:
- To explore the feasibility and effectiveness of the proposed AI-based facial recognition attendance system with an RFID-based door lock system.
- To investigate the accuracy and reliability of the system in marking attendance.
- To examine the effectiveness of the system in reducing attendance-related fraud.
- To analyze the potential time and productivity savings that

can be achieved through the adoption of the system.

IV. METHODOLOGY

To achieve the research objectives, the study will use a mixed-methods approach that combines both qualitative and quantitative research methods. The study will involve a literature review to gather information on the existing literature and research on AI-based facial recognition attendance systems and RFID-based door lock systems.

The study will also involve a survey of employees to gather their perceptions of the proposed system and their experiences with traditional attendance management systems. The survey will be conducted using a structured questionnaire, and the data collected will be analyzed using descriptive statistics.

In addition to the survey, the study will also involve a case study analysis of organizations that have adopted AI-based facial recognition attendance systems with an RFID-based door lock system. The case study analysis will provide insights into the effectiveness of the system in practice and its impact on organizational performance.
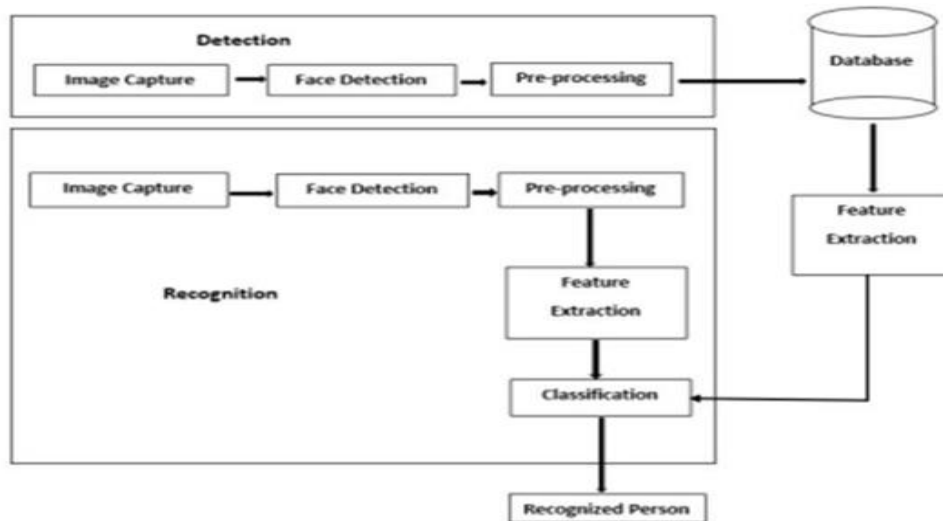

Fig 1 RFID

V. CONCLUSION

The proposed AI-based facial recognition attendance system with an RFID-based door lock system is a new technological development that offers several advantages over traditional attendance management methods. The system has the potential to improve accuracy, reduce fraud, and save time and increase productivity. However, its effectiveness and feasibility need to be explored through further research. This study aims to fill this research gap by investigating the proposed system's accuracy, reliability, effectiveness, and potential impact on organizational performance.

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