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School of
**Engineering &
Technology**

A

SYNOPSIS PROJECT REPORT ON

“AI Attendance using facial recognition ”

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Certificate

This is to certify that Project work entitled **“AI Attendance Using Facial Recognition”** Submitted in partial fulfillment of required for the award of the **B.Tech in Information Technology** by **SCHOOL OF ENGINEERING&TECHNOLOGY AMBI (PUNE)**, as a record of student own work carried out by them.

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INTRODUCTION:

The Facial recognition technology, powered by Artificial Intelligence (AI), has emerged as a game-changer in attendance management systems. By harnessing AI algorithms, this innovative solution accurately identifies individuals based on their unique facial features, offering a seamless and secure method for tracking attendance. Organizations can benefit from reduced manual errors, enhanced operational efficiency, and real-time monitoring capabilities, providing administrators with instant updates on attendance data for proactive decision-making.

Moreover, AI-driven facial recognition attendance systems promote a contactless experience, particularly valuable in today's health-conscious environment. Employees simply need to stand in front of designated cameras for attendance, eliminating the need for physical touch or proximity. In essence, this technology represents a significant advancement in attendance management, offering unparalleled accuracy and efficiency while aligning with modern health and safety standards.

PROBLEM DEFINATION:

The Traditional attendance tracking methods are often inefficient, error-prone, and outdated, failing to meet the evolving needs of modern organizations. The primary challenge lies in the manual nature of these systems, which are susceptible to errors and lack real-time updates. Additionally, conventional biometric systems pose health and safety concerns due to physical contact requirements.

To address these challenges, the implementation of an AI-based attendance system using facial recognition is proposed. This system aims to streamline attendance tracking, minimize errors, and provide real-time insights into workforce attendance. By leveraging facial recognition technology, the solution offers a contactless and efficient alternative to traditional methods, ensuring accuracy and convenience. However, ethical considerations regarding biometric data privacy must be carefully addressed in the development and deployment of this technology. Ultimately, the goal is to revolutionize attendance management practices, providing organizations with a reliable and future-ready solution tailored to the demands of the modern workplace.

PROPOSED METHODOLOGY:

1. Data Collection and Preparation:

Gather a diverse dataset of facial images representing employees under various lighting conditions, angles, and facial expressions.

Preprocess the dataset to enhance image quality, normalize facial features, and remove noise or irrelevant information.

2.Facial Recognition Model Development:

Train a deep learning model, such as a Convolutional Neural Network (CNN), for facial recognition using the preprocessed dataset.

Utilize transfer learning techniques with pre-trained models (e.g., VGG, ResNet) to expedite training and improve performance.

Fine-tune the model to optimize for facial recognition accuracy, considering factors like occlusion, pose variations, and demographic diversity.

3.Integration with Attendance Management System:

Develop an interface to capture live video streams from designated cameras within the organizational premises.

Implement real-time facial recognition algorithms to detect and recognize faces from the video feed.

Integrate the facial recognition module with the attendance management system to log timestamps for recognized faces.

4.Attendance Tracking and Monitoring:

Design algorithms to compare recognized faces with the existing database of employees and register attendance upon identification.

Implement features for attendance monitoring, including attendance reports, notifications for absentees, and real-time dashboards for administrators.

Incorporate mechanisms for handling exceptions, such as unrecognized faces or multiple matches, with manual verification options.

5.Performance Evaluation and Iterative Improvement:

Evaluate the performance of the AI attendance system using metrics like recognition accuracy, false acceptance rate, and processing speed.

Collect feedback from users and administrators to identify areas for improvement and refine system functionalities.

Continuously update the facial recognition model with additional data and fine-tuning to adapt to changing environmental conditions and improve overall performance.

6.Privacy and Security Considerations:

Implement robust data protection measures to safeguard sensitive biometric information, adhering to relevant regulations such as GDPR.

Ensure transparency in data usage and obtain consent from employees for facial recognition-based attendance tracking.

Employ encryption techniques to secure data transmission and storage, minimizing the risk of unauthorized access or data breaches.

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