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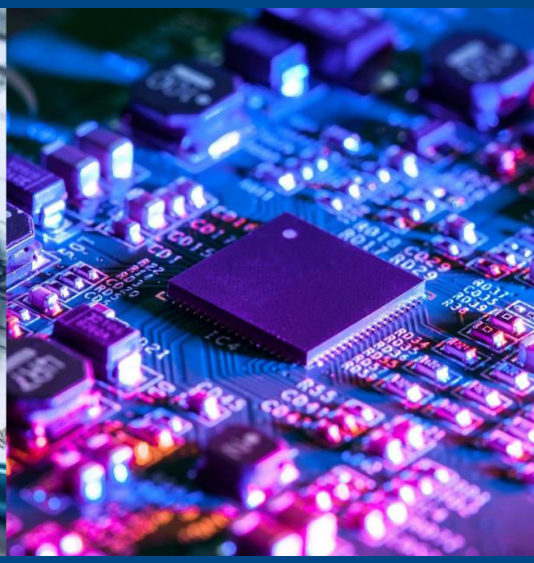

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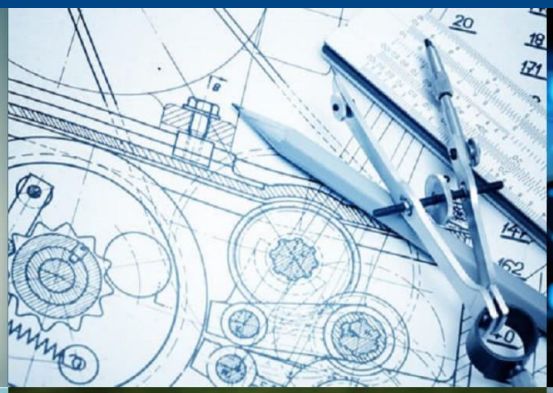

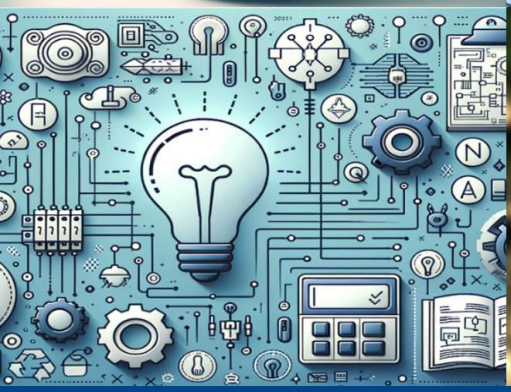

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Automated Employee Tracking System for Enhanced Workforce Management

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ABSTRACT: An Employee Tracking System (ETS) is a software solution designed to automate the monitoring and management of employees' activities, attendance, and productivity. The system typically includes features such as time tracking, task management, and performance monitoring, enabling organizations to optimize their workforce and enhance operational efficiency. Existing employee tracking systems, however, face several challenges. Traditional methods, such as manual attendance recording, spreadsheets, or outdated software, are prone to errors, are time-consuming, and lack real-time tracking capabilities. These systems often result in inaccurate payroll processing and difficulties in monitoring task completion and employee performance. The proposed Employee Tracking System addresses these limitations by integrating attendance management, task monitoring, and payroll processing into a single cohesive platform. The system automates attendance tracking, ensuring accurate recording of work hours, and provides real-time task monitoring to track progress and completion. Additionally, it synchronizes attendance and task performance data with payroll calculations, streamlining the payroll process. This integrated solution improves accuracy, reduces administrative overhead, and provides valuable insights for better decision-making, leading to more efficient workforce management and increased productivity.

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KEYWORDS: Employee Tracking System, Attendance Management, Payroll Processing, Real-time Tracking, Automated Attendance

I. INTRODUCTION

Traditional attendance management refers to the conventional methods used by organizations to monitor when employees start and end their workday, as well as their presence at the workplace. These methods often include manual systems such as paper-based attendance registers, punch cards, or biometric systems like fingerprint or card swipes at entry points. These approaches primarily focus on recording the physical presence of employees during scheduled work hours. While effective for basic time tracking, these systems provide limited insight into what employees accomplish during their work time. Traditional task management, on the other hand, involves assigning, monitoring, and evaluating employee tasks using manual methods or basic tools. Common practices include using handwritten to-do lists, Excel spreadsheets, verbal instructions, whiteboards, or printed schedules. Supervisors may directly oversee employees to ensure tasks are being completed, relying heavily on personal observation and communication. These methods lack automation, real-time updates, or collaborative features, which can result in miscommunication, task duplication, or missed deadlines. Together, traditional attendance and task management systems served their purpose in structured, physical office environments where supervisors could closely monitor work. However, they fall short in modern, dynamic, or remote work settings due to limitations in scalability, accuracy, integration, and data analysis. Organizations today are increasingly transitioning to digital systems that combine attendance tracking with task management to improve productivity, transparency, and accountability.

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II. METHODOLOGY

1. User Authentication and Role Access:
The system begins with a secure login process where users, including Admins, HR personnel, Managers, and Employees, enter their credentials. Upon successful verification, users are directed to their respective role-based dashboards that provide access to functionalities tailored to their responsibilities and permissions

2. Employee Face Enrolment:
New employees undergo a one-time facial enrolment process where multiple facial images are captured under varied conditions to ensure recognition accuracy. Utilizing the Faster R-CNN deep learning algorithm, the system processes these images to extract distinctive facial features, creating a reliable template stored securely in the database for future attendance verification.

3. Attendance Logging and Verification:
At the start and end of each workday, employees log their attendance by scanning their face through the system. The live facial scan is matched against the stored facial templates using the Faster R-CNN algorithm enhanced with anti-spoofing measures to prevent fraudulent attempts such as using photos or screens. Verified check-ins and check-outs are recorded precisely, and duplicate or unauthorized attempts are rejected to maintain data integrity.

4. Task Management and Monitoring:
Managers assign tasks to employees based on their roles, availability, and skill sets, setting priorities and deadlines. Employees receive instant notifications about their assignments and update task statuses such as "In Progress" or "Completed" via the system interface. Managers monitor these updates in real-time, enabling proactive management of workloads and project progress through visual dashboards.

5. Leave Management:
Employees can submit leave requests through the system, which are then reviewed and approved or rejected by HR personnel. Approved leaves are integrated into the attendance records, ensuring accurate tracking of absences and their impact on payroll and performance evaluations.

6. Payroll Processing:
The system consolidates attendance data, including hours worked, overtime, and leave status, alongside task completion information to automate payroll calculations. It accommodates complex pay structures such as shift differentials and allowances. Generated salary slips are accessible to employees, while HR and Admin maintain oversight for auditing and adjustments, ensuring transparency and accuracy.

7. Notifications and Alerts:
A comprehensive notification system keeps all users informed with real-time alerts delivered via email, SMS, or in-app messages. Notifications include reminders for attendance logging, task deadlines, leave status changes, and payroll updates. This continuous communication helps improve compliance, punctuality, and overall workforce discipline.

8. Reporting and Analytics:
The system offers robust reporting capabilities, allowing customized generation of reports related to attendance, task performance, payroll summaries, and employee evaluations. These reports can be filtered by department, date range, or individual employees and are available in downloadable formats such as PDF and Excel. Visual dashboards provide actionable insights, facilitating strategic decision-making by management.

9. System Administration and Maintenance:
Administrators oversee the entire platform by managing user roles, configuring system settings, and ensuring security protocols are in place. Regular system audits and data backups are conducted to preserve data integrity and comply with regulatory requirements. Activity logs maintain a transparent record of user interactions for accountability and troubleshooting. This structured system flow guides the Employee Tracking System from user access and biometric attendance through task management, payroll processing, and comprehensive reporting, creating a streamlined and efficient workforce management solution.

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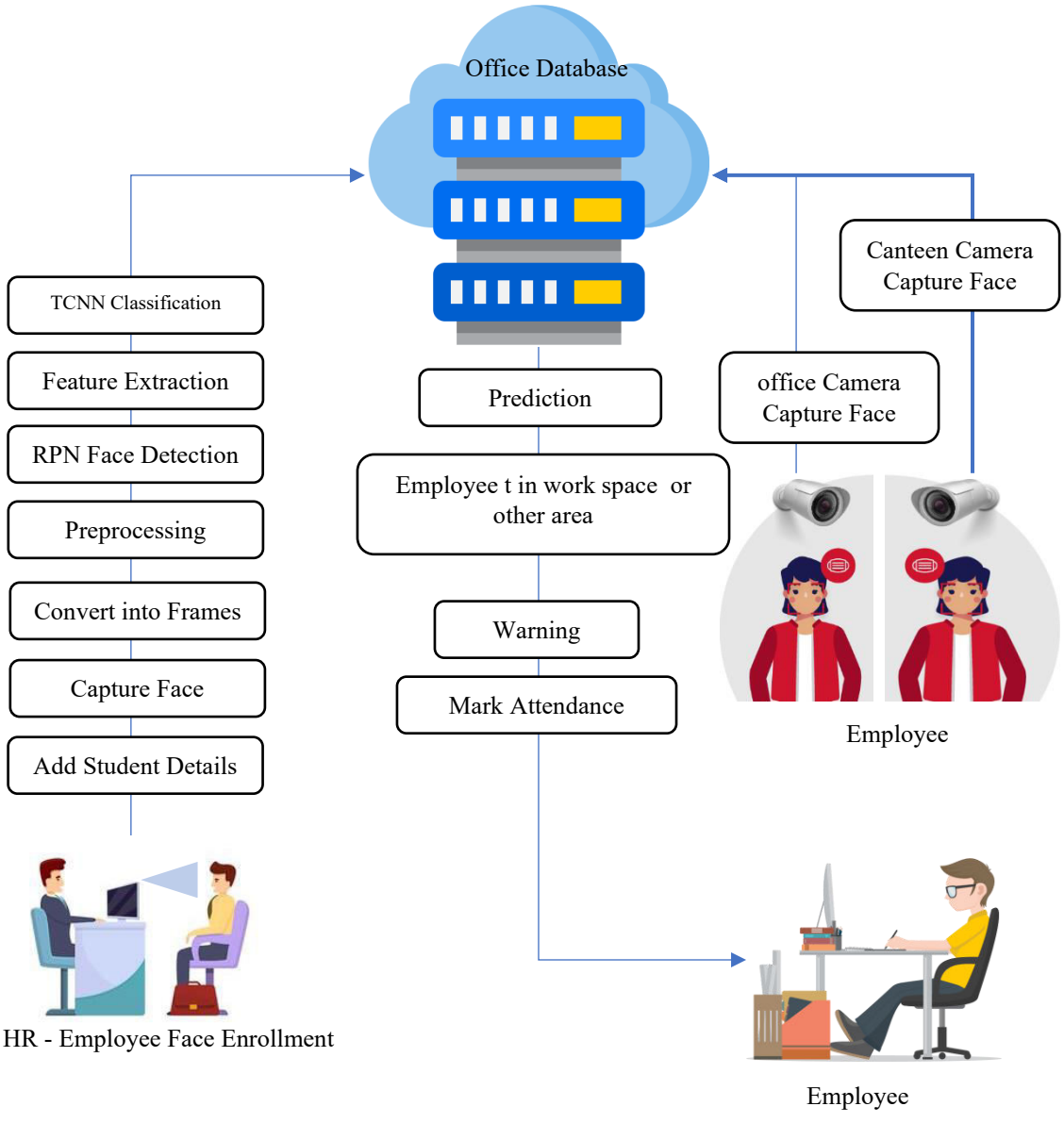
ARCHITECTURE DIAGRAM



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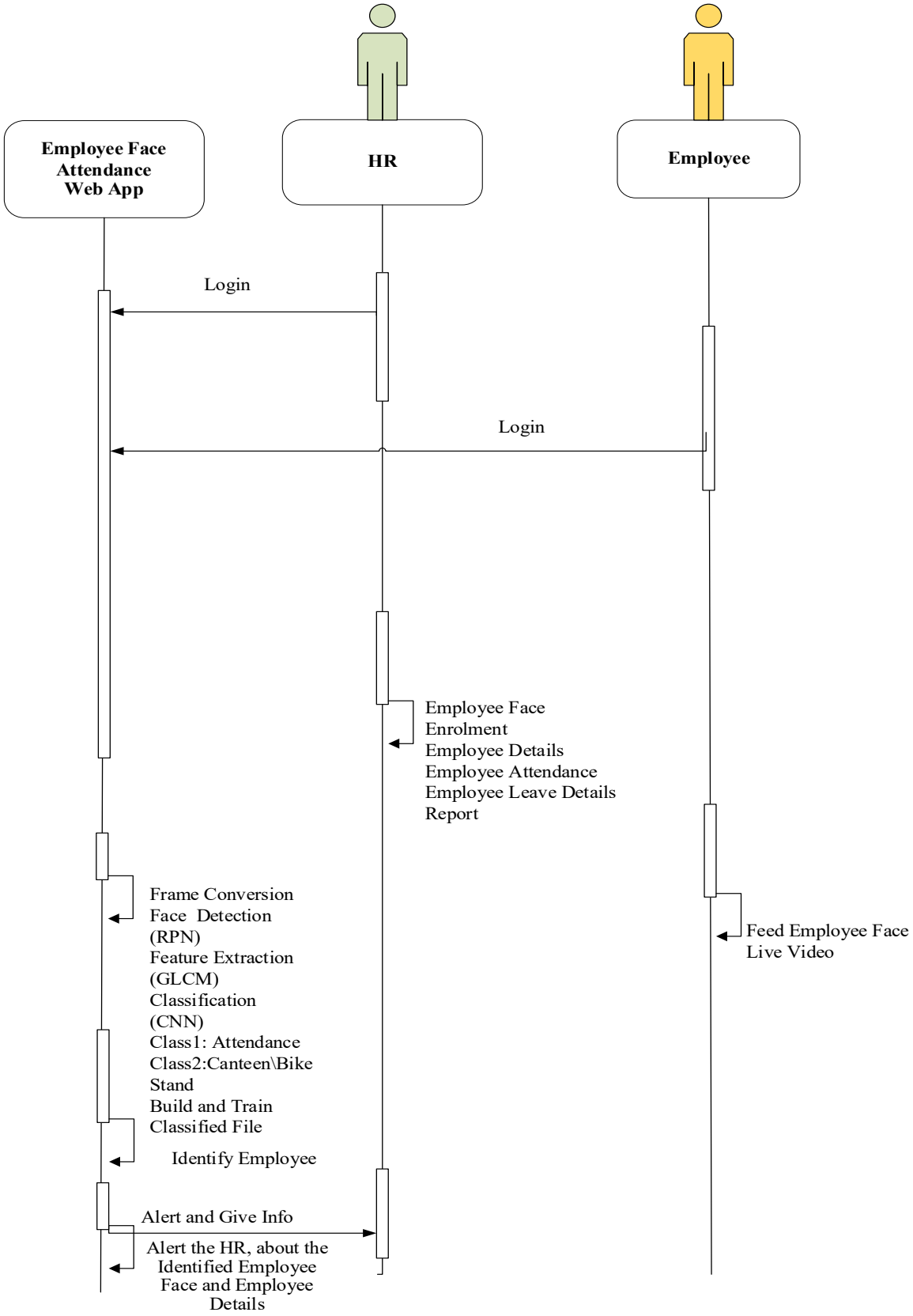

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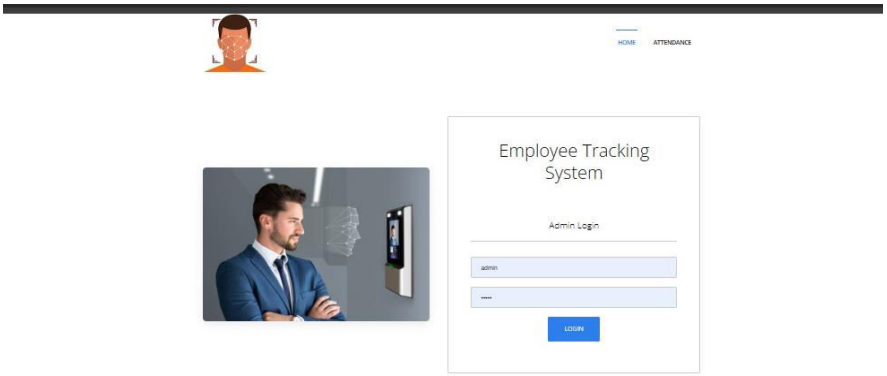
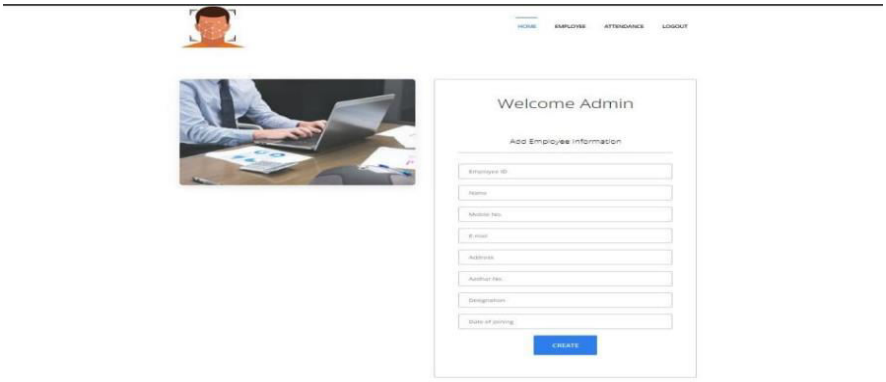
III. RESULT AND DISCUSSION

The AI-based Employee Attendance Management System using Faster R-CNN offers a significant advancement in attendance tracking by automating the process and ensuring accuracy with facial recognition technology. It helps eliminate fraudulent activities like buddy punching by incorporating anti-spoofing features, which prevent unauthorized attempts using photographs or masks. Additionally, the system improves efficiency, reduces manual labor, and enhances data insights, making it a scalable and secure solution for modern workforce management.





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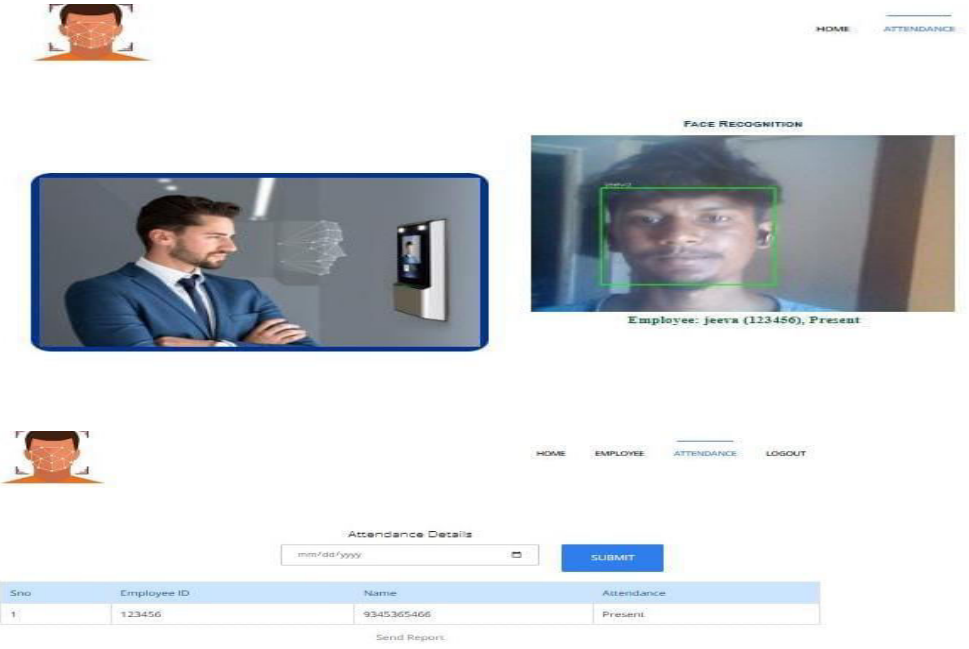

VI. CONCLUSION

In conclusion, the project is a designed for precise and efficient management of attendance and task workflows using advanced facial recognition technology. Developed with robust back-end and front-end components, the system automates attendance logging, task assignment, progress tracking, and payroll calculation to streamline workforce management. The multi-role User Dashboard offers tailored functionalities for Company Admins, HR, Managers, and Employees, facilitating secure access, real-time attendance verification, task updates, and performance monitoring. The system follows a comprehensive process that includes facial data enrollment with Faster R-CNN, live facial verification, automated attendance capture, and seamless integration with task and payroll modules to ensure operational accuracy and transparency. Notifications and detailed reporting modules further enhance communication and decision-making within the organization. Through thorough testing, the system has proven to be reliable, scalable, and user-friendly, confirming its effectiveness for practical deployment. This project successfully combines AI-driven biometric verification with organizational management tools to revolutionize employee tracking, reduce manual overhead, prevent fraudulent practices, and improve overall productivity and accountability.

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