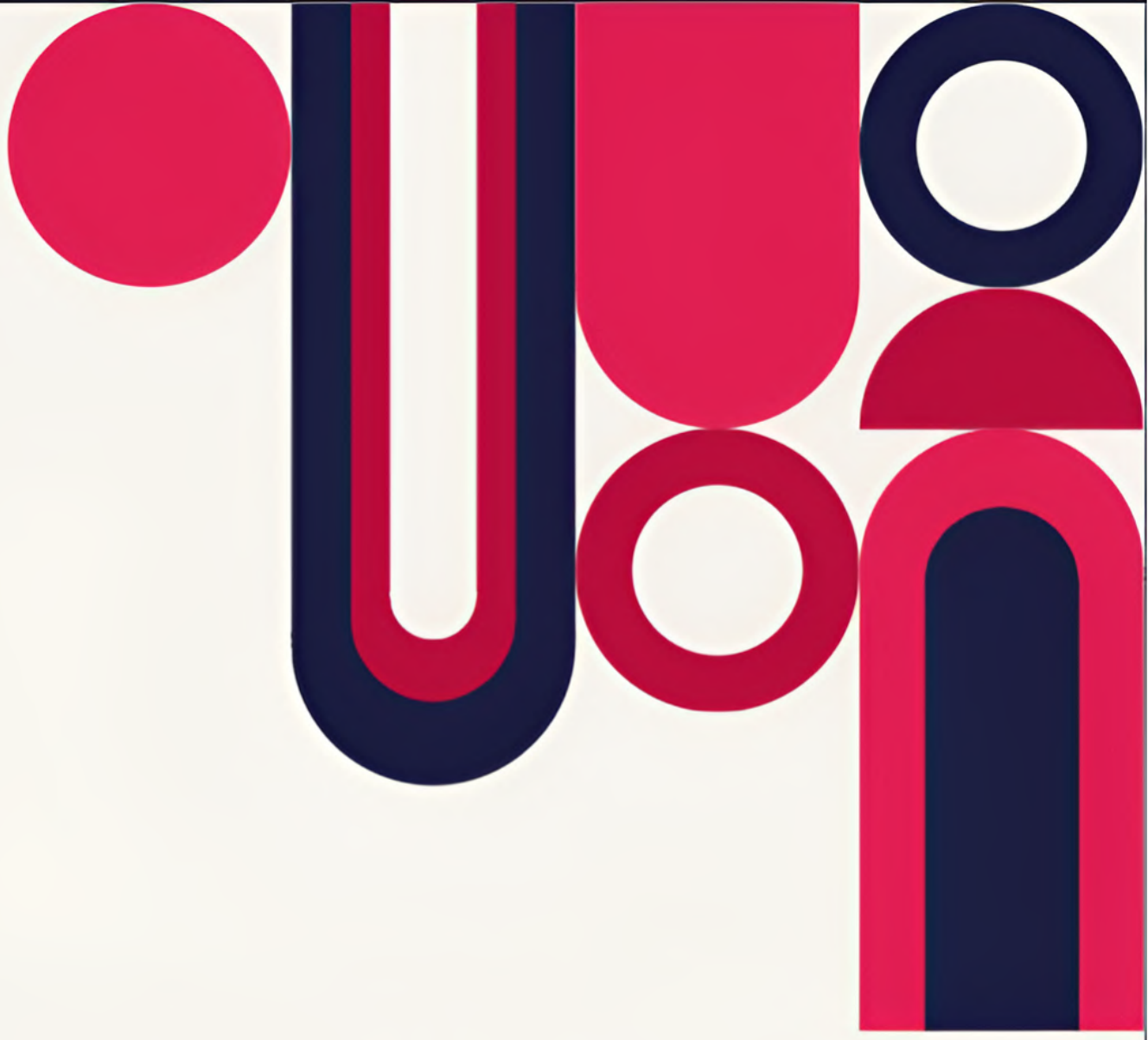

Gait + Face based
Attendance System

IDEA PLAN

Made by

POROTTA
PIONEERS

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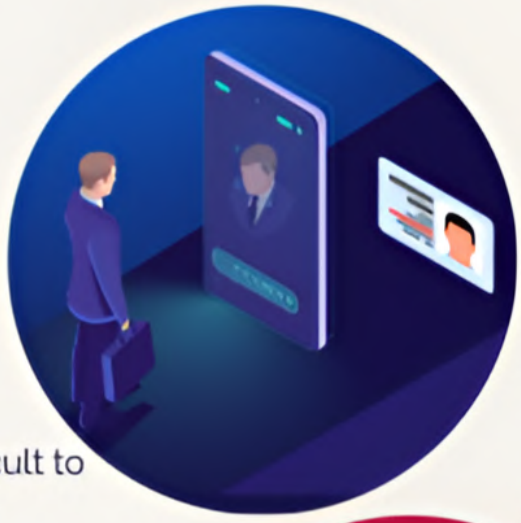
Problem Statement

Theme selected

Smart Attendance: Building Intelligent Solutions for Field Operations



Traditional attendance tracking in mobile work environments is inefficient, error-prone, and difficult to scale, leading to inaccurate data and increased administrative overhead. Factors like extreme weather, sweaty or dry palms, remote locations, high workforce turnover, lack of IDs or uniforms, and large teams further complicate the process in industries like construction, agriculture, and field services. Our solution leverages AI to develop a real-time, intelligent attendance system that overcomes these challenges, ensuring accurate workforce tracking, improved productivity, .

Key Objectives

- Enhance Accessibility
- Ensure Data Accuracy
- Provide Real-time Insights
- Streamline Integration
- AI-Powered Anomaly Detection

PROPOSED SOLUTION & FEATURES

Attendance Marking Recognition part

Gait Recognition System (Main/Innovative part)

1. **Gait-Based Recognition:** Uses an individual's unique walking pattern for authentication, eliminating the need for traditional biometric methods.
2. **Contactless & Non-Intrusive:** Works from a distance without requiring any direct interaction, ensuring a smooth user experience.
3. **Deep Learning-Powered:** Leverages advanced gait recognition models like All-in-One Gait for accurate identification.
4. **Multi-View Adaptability:** Recognises individuals from different angles and walking styles, making it more robust in real-world scenarios.
5. **Privacy-Focused**: Unlike facial recognition, gait recognition does not rely on facial features, reducing privacy concerns.
6. **Resilient to Harsh Conditions:** Unlike fingerprint scanners, which fail due to sweaty palms or dry skin, gait recognition works in extreme weather conditions.
7. **Scalable & Non-Intrusive:** Ideal for large workforces and mobile environments, as it does not require close-proximity scans.

Face Recogniton system (as a fallback/backup option)

1. **AI-Powered Face Recognition:** Uses deep learning models to accurately identify individuals based on facial features, ensuring reliable authentication.
2. **Multi-Factor Authentication (Gait + Face):** If gait recognition fails, the system automatically switches to facial recognition, maintaining accuracy without disrupting operations.
3. **Adaptive Learning & Continuous Improvement:** The system continuously refines both gait and face recognition models using AI, improving accuracy over time by adapting to changes in an individual's walking style or facial features.

Connection with mobile app

Real-Time Attendance Confirmation: Employees can instantly check their attendance status, view timestamps, and receive notifications when their attendance is successfully marked using gait or face recognition.

Personal Calendar & Work Schedule: The app provides a personalized dashboard displaying work schedules, upcoming shifts, leave requests, and attendance history, helping employees stay organized.

PROPOSED SOLUTION & FEATURES

Admin Dashboard part

Real-Time Insights

Provides live attendance updates with analytics on workforce availability, entry/exit times, and department-wise attendance trends.

AI Anomaly Detection

Uses AI to flag suspicious behavior such as unauthorized access attempts, duplicate entries, or abnormal movement patterns.

Live Camera Feed

Displays real-time video streams from attendance checkpoints, allowing admins to monitor entry points and validate attendance logs.

Predictive Analytics

Uses machine learning to forecast attendance trends, absenteeism rates, and workforce demand for better resource planning.

PROPOSED SOLUTION & FEATURES

Admin Dashboard part

Comprehensive Reports

Generates detailed reports on employee attendance, overtime, shift adherence, and historical trends for audits and decision-making.

Instant Alerts & Notifications

Sends real-time alerts for attendance discrepancies, system failures, or unusual activity, ensuring quick action.

Role-Based Access

Provides customizable access levels for admins, managers, and supervisors, ensuring data security and controlled permissions.

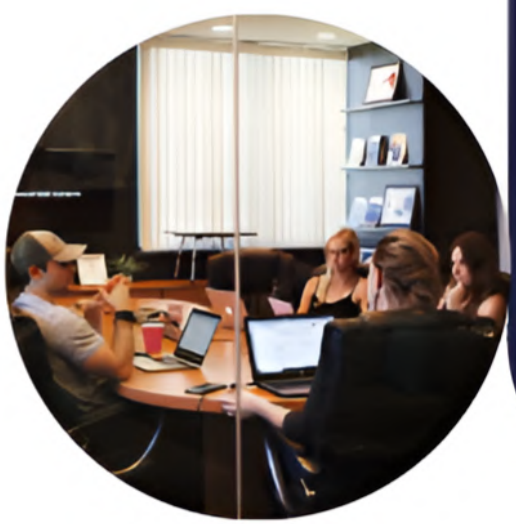
Data Export & API

Supports exporting attendance data in multiple formats (CSV, Excel, PDF) and offers APIs for seamless integration with third-party tools.

Target Audience

This AI-powered attendance system can be expanded to almost any industry requiring secure, automated workforce tracking.

- Corporate & Enterprises
- Educational Institutions
- Construction & Field Workforces
- Educational Institutions
- Logistics & Warehousing

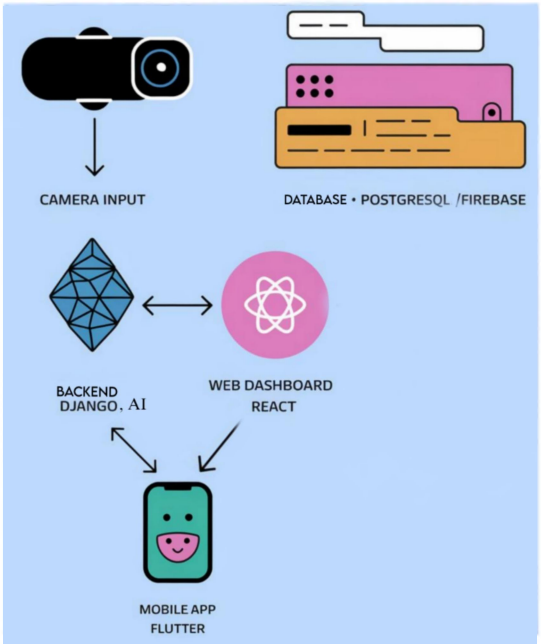


Solution Architecture

Technology Stack

Backend (Python & Django) – Manages authentication, attendance processing, and AI model integration for gait and face recognition.
AI Model (Pytorch/Tensorflow Integration) – Implements deep learning-based gait and face recognition models within the Django backend.
Admin Dashboard (React) – Provides a real-time, interactive interface for monitoring attendance, reports, and workforce analytics.
Mobile Apps (Flutter) – Ensures cross-platform compatibility for employees to check attendance status and schedules on both iOS and Android.
Cloud & Database (PostgreSQL / Firebase) – Stores attendance logs, user data, and AI model outputs with real-time syncing capabilities.

High - Level Workflow , Simple Workflow



BUSINESS VALUE

This AI-powered attendance system enhances workforce management by providing seamless, contactless authentication using gait and face recognition. It ensures accuracy, security, and efficiency while reducing costs and administrative burdens.

📈**Increased Efficiency –** Automates attendance tracking, reducing manual effort and administrative overhead.
💰**Cost Savings –** Eliminates the need for physical IDs, biometric devices, and manual record-keeping.
🔐**Enhanced Security –** AI-driven authentication prevents fraud, ensuring accurate workforce tracking.
📊**Data-Driven Insights –** Provides real-time analytics for better workforce planning and decision-making.

Future Enhancements

Edge AI for Offline Mode

Deploying AI models on edge devices to enable real-time attendance tracking even in remote areas with limited internet connectivity.

Blockchain for Data Security

Utilizing blockchain to ensure tamper-proof attendance records and enhance data integrity.

GPS & Beacon-Based Validation

Adding geofencing and Bluetooth beacon-based validation for precise location-based attendance tracking.

TEAM DEATILS

We are 6th-semester B.Voc Data Science students from St. Thomas College, Thrissur, passionate about AI-driven solutions for real-world challenges.

Adhithyan VP (Team Leader) – Manages Backend development using Django and integrates AI models for gait and face recognition.

Stebi AR (Frontend Developer) – Develops the React-based Web Admin Dashboard for real-time monitoring and analytics.

Sreesh K Suresh (Flutter Developer) – Builds the Flutter mobile app for attendance tracking and user interaction.

Conclusion

Gait recognition is an innovative and rapidly evolving technology with immense potential in secure and contactless authentication. Our AI-powered attendance system leverages this cutting-edge approach to provide a seamless, efficient, and fraud-resistant workforce tracking solution. By integrating Django for backend processing, React for the web admin dashboard, and Flutter for mobile accessibility, we ensure a scalable and user-friendly system. With additional features like real-time insights, AI anomaly detection, and multimodal authentication, this solution addresses the limitations of traditional methods.

Gait recognition is one of the most promising areas of AI research, continuously improving in accuracy and adaptability, making it a valuable asset for the future of identity verification and workforce managemen