Full Proof Attendance System

The Problem

Incorporating biometric and facial recognition systems into an inexpensive attendance system is quite challenging. Facial recognition technology, specifically, demands significant processing power, often requiring costly, high-end processors. Implementing a dual biometric system (merging fingerprint and facial recognition) while meeting this requirement is challenging for organizations due to the high associated costs.

The Solution

Our attendance system offers a solution to effectively combine biometric and facial recognition technologies in a cost-effective way. The system utilizes an IP camera or wireless camera to gather facial data, with all intensive processing handled by a server or cloud infrastructure. This method lowers expenses on hardware while maintaining scalability and efficiency. The system provides precise attendance tracking in real-time through an IoT-enabled Android app.

Working Procedure

- **Registration Phase:** The administrator starts by looking for the user using their organization ID in the Android application. After being recognized, the user's fingerprint is recorded by a fingerprint sensor, saved in the system, and associated with their profile in Firebase. Afterward, the app captures the user's facial data and uploads it to Firebase Storage. While performing planned maintenance, the server analyzes this facial data by extracting various images in order to train a KNN classifier for facial recognition.
- **Phase of Recording Attendance:** The process implemented by the system involves two steps. Initially, the user scans their fingerprint. If the fingerprint is a match with the data on record, the system will turn on the camera to record the user's facial data. The image that has been taken is analyzed immediately to confirm the user's identity. After verification is successfully completed, attendance is recorded in the Firebase Realtime Database.
- **Real-Time Monitoring Phase:** The Android application enables real-time monitoring by linking to Firebase to access current attendance information. Users have the ability to check their attendance record and past attendance, while administrators can create reports, and oversee user profiles, promoting transparency and effectiveness.

Fig.1. Finger print node

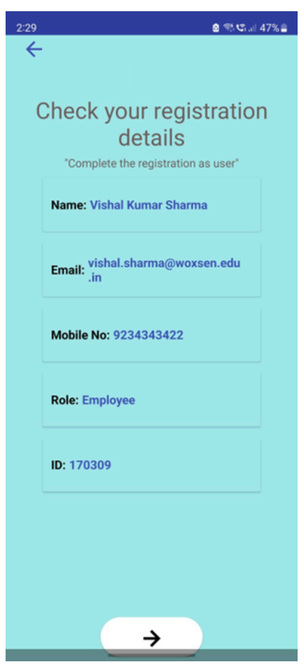

Fig.2. Registration page

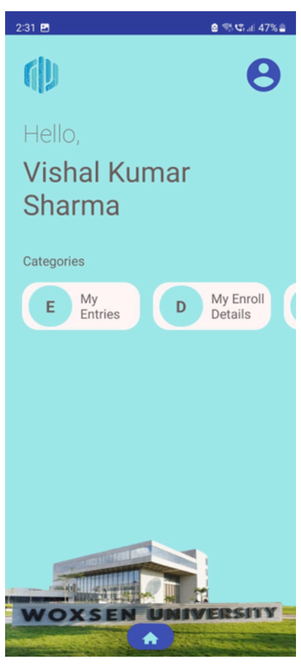

Fig.3. User home page

Applications

- **Educational Institutions:** Automates student attendance tracking, reduces administrative workload, and ensures accurate records.
- **Corporate Offices:** Enhances employee attendance management with secure biometric verification, providing reliable data for payroll and HR purposes.
- **Events and Conferences:** Manages attendee check-ins securely and efficiently, providing organizers with real-time data on attendance.