Automated and No-Touch Attendance System

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Brief Overview:

Our project aims to develop a system wherein a face recognition module will identify a person and then mark his/her attendance in the respective organization without using traditional methods like register entry or fingerprint-based biometric attendance, which are tedious and time-consuming. This could be even more beneficial in the recent pandemic period (Covid-19).

The human face is a unique representation of individual identity. **Face recognition** is defined as a biometric method in which identification of an individual is performed by comparing real-time captured images with stored images of that person in the database.

The methodology flow begins with the pre-processing of a photo of the individual, then facial feature extraction from the photo, subjective selection, classification of the facial features to be recognized.
A camera detects the faces of individuals. These faces are then matched using AI to the available images, useful features extracted from the images, and classification done to identify the individual. Then their attendance is marked using the details that are retrieved from the organization's database.

An **email notification** is sent to the person confirming that his/her attendance has been marked and the changes updated in the database.

An **app** that will display the details of the attendance is available, which will have a private log-in so that every individual can see his/her record.

This app has a **home-page** that displays the monthly attendance percentage, the number of days present, monthly unpaid leaves taken and annual paid leaves left. A drop-down list of all the months enables the user to navigate to and check the required month's details. There is a navigation bar at the bottom containing two more buttons for the calendar tab and the profile tab.

The **profile tab** contains the user's name, email id, department, and phone number. A switch button to enable email notifications is also included, so is a "Change Password" button. A sign-out button signs out the user. Unless the person signs out he/she will be kept logged in.

The **calendar tab** contains detailed information for each day of the year, displaying the attendance status for the day, and if the person were present, the entry and exit time.

Incorporation of Web Technologies:

The technologies which we have utilized are Google Firebase and Flutter.
Flutter in Android Studio makes up our front end. The app has been written entirely in Dart (a language in the Flutter package).

Google Firebase is the database server for the project, of which we have utilized the following services:

- **Firebase Authentication** is employed at the login-in stage to authenticate the user.

- We have used **Cloud Firestore**, a NoSQL document-oriented database in which the structures alternate between documents and collections of documents. This contains the entire record of the attendance. The entire database is created and the data updated using python. Cloud Firestore is accessed by this code that marks attendance using face recognition, and also by the app, that reads and displays the data to the user.

- **Firebase Storage** contains the folder for the images of the employees which are matched against the pictures taken every day by the office cameras.