Attendbook

Team Name- **Code Craft**
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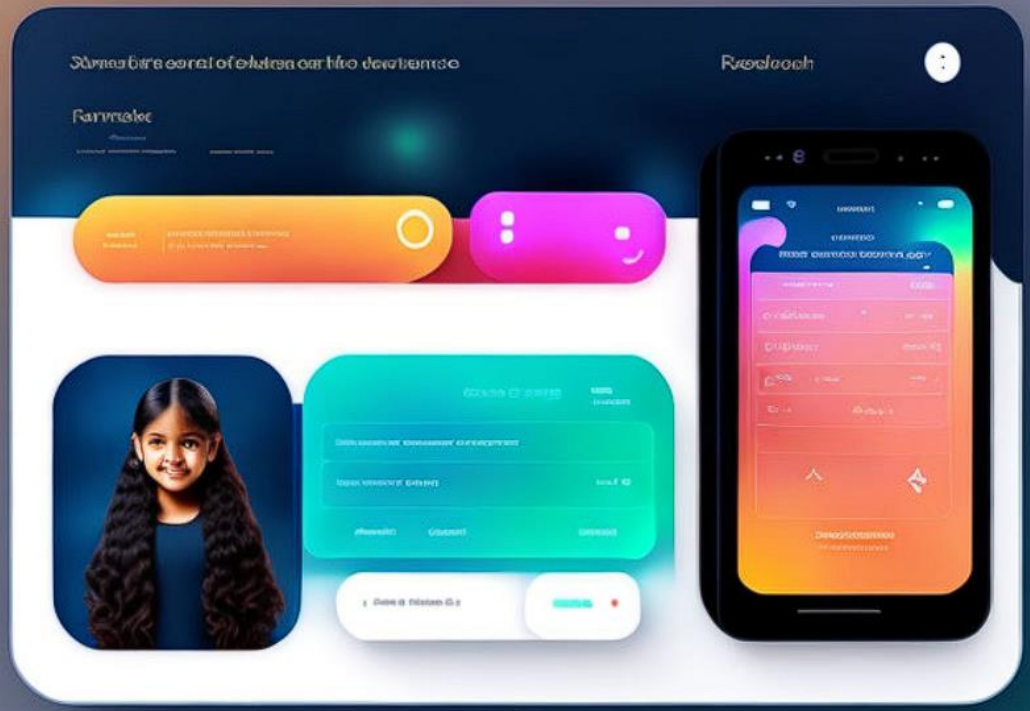
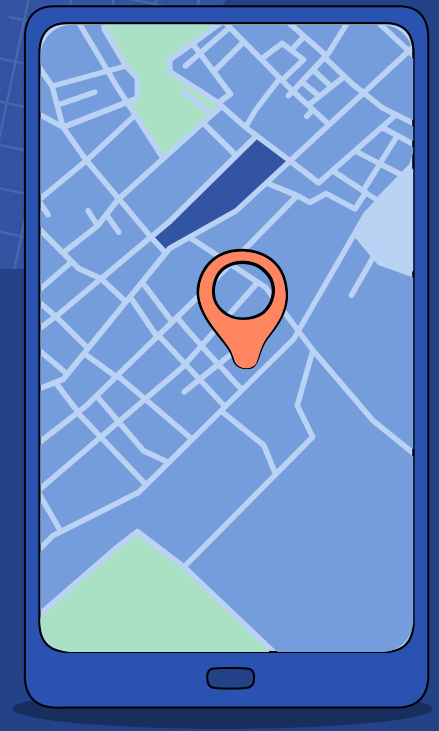
Overview of Our app

- We will design the UI and UX of the mobile app using tools like Adobe XD, Sketch, or Figma.
- Next we will develop the app on the Android platform using Java or Kotlin programming languages and the Android SDK.
- Than integrate the TensorFlow deep learning framework for the face recognition feature and train the model using a large dataset of employee faces.
- Next we will implement the geo-location and geo-fencing feature using the Google Maps API and Android's location services.
- After that we will integrate the Ethereum blockchain for secure and transparent storage of attendance data using Solidity programming language for the smart contract.
- We will also Implement additional features like QR code scanning, push notifications, and reporting.

Design and Development of App

The app should be easy to use and capture basic employee details such as photograph, name, designation, employee number, gender, office address, etc. The app should also be designed to recognize the employee's face using deep learning-powered computer vision for face recognition





Deep Learning Powered Computer Vision

Our app will use deep learning-powered computer vision technology for face recognition attendance capturing. We will collect a dataset of employee photographs and train a convolutional neural network to recognize different types of faces accurately. The mobile app will use this model to match employees' faces with the information stored in the system, including their basic details and photograph. We will also use techniques such as face alignment, normalization, and augmentation to ensure that the images are of high quality. The system will be rigorously tested and continuously improved to ensure that it is accurate and reliable, enabling employees to capture their attendance quickly and easily.

Integration With Blockchain

- The integration with blockchain for our attendance capturing app will take place as follows:

- Creation of Smart Contract: A smart contract will be created on the blockchain to manage the attendance data. The smart contract will define the rules and conditions for capturing attendance and store the attendance data in a secure and transparent manner.
- Capture of Attendance Data: When an employee captures their attendance using the mobile app, the app will use the deep learning-powered face recognition technology to verify the employee's identity and capture their attendance data. This data will be encrypted and securely transmitted to the smart contract on the blockchain.
- Validation of Attendance Data: The smart contract will validate the attendance data to ensure that it meets the predefined rules and conditions. If the data is valid, it will be stored on the blockchain. If the data is not valid, the smart contract will reject it.
- Immutable Record-Keeping: The attendance data stored on the blockchain will be immutable, meaning that it cannot be modified or deleted. This ensures that the attendance data is secure and transparent, and can be trusted by all stakeholders.
- Reporting and Analysis: The attendance data stored on the blockchain can be used for reporting and analysis, enabling employers to gain insights into attendance patterns and trends, identify areas for improvement, and make data-driven decisions.

Steps for Integrating Blockchain

- Create a new Ethereum account and obtain some test Ether to deploy and test the smart contract on the Rinkeby test network.
- Install and configure the Truffle framework and Ganache CLI to develop and test the smart contract locally.
- Create a new Solidity file named AttendanceContract.sol and define the smart contract.
- Compile the smart contract using the Truffle framework and deploy it on the Rinkeby test network using a tool like Remix IDE or MyEtherWallet.
- Implement the web3.js library in the mobile app to interact with the deployed smart contract and store and retrieve the attendance data on the blockchain.
- Add the required permissions to the app's AndroidManifest.xml file to access the internet and use web sockets:
- In the app's main activity, create a new web3j instance and connect to the Rinkeby test network:
- Load the smart contract ABI and contract address:
- Instantiate the smart contract using the web3j instance and the ABI and contract address:

Geo-location and Geo-fencing

The integration of geo-location and geo-fencing in our attendance capturing app will take place as follows:

- **Define Geo-fenced Area**: We will define a geo-fenced area around the office premises using the GPS coordinates of the area. This area will be stored in the app as a set of latitude and longitude coordinates.
- **GPS Location Tracking:** The mobile app will use the GPS technology of the employee's device to determine their current location. This location will be compared to the predefined geo-fenced area to determine whether the employee is within the defined area.
- **Check for Geo-fenced Area**: If the employee's location is within the predefined geo-fenced area, the app will allow them to capture their attendance using the deep learning-powered face recognition technology. If the employee's location is outside the predefined area, the app will not allow them to capture their attendance.
- **Capture Attendance Data:** If the employee is within the geo-fenced area and successfully captures their attendance using face recognition, the app will capture their attendance data, including their entry/exit time and GPS location.
- **Validation of Attendance Data:** The attendance data captured by the app will be validated to ensure that it meets the predefined rules and conditions, including the geo-fencing requirements.
- **Storage of Attendance Data on Blockchain**: Once the attendance data has been validated, it will be securely stored on the blockchain as an immutable record, ensuring that it cannot be tampered with or modified.

Code for Geo-Location

1.First, add the following permissions to your app's `AndroidManifest.xml` file:

```
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
```

Code for Geo-Location

2. In the onCreate method of your main activity, initialize the LocationManager and request location updates:

```
// Initialize LocationManager
LocationManager locationManager = (LocationManager) getSystemService(Context.LOCATION_SERVICE);

// Check if location services are enabled
if (!locationManager.isProviderEnabled(LocationManager.GPS_PROVIDER)) {
    // Show an error message or prompt the user to enable location services
}

// Define the location update listener
LocationListener locationListener = new LocationListener() {
    @Override
    public void onLocationChanged(Location location) {
        // Handle the location update
    }
}

// Request location updates
locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0, locationListener);
```

Code for Geo-Location

3. Override the on Destroy method and remove location updates:

```
@Override
protected void onDestroy() {
    super.onDestroy();
    locationManager.removeUpdates(locationListener);
}
```

4.Handle the location update in the on Location Changed method of the Location Listener:

```
@Override
public void onLocationChanged(Location location) {
    // Get the latitude and longitude of the location
    double latitude = location.getLatitude();
    double longitude = location.getLongitude();

    // Use the location data as needed
}
```

Why our APP?

- Sure, here are some of the best points of the app mentioned above:
- Efficient attendance tracking: The app provides a hassle-free and efficient way of tracking employee attendance with the help of deep learning-powered face recognition technology.
- Accurate tracking: The app has a high accuracy rate of over 95%, ensuring that the attendance tracking is reliable and dependable.
- Secure and tamper-proof: The app's integration with blockchain technology makes the attendance records secure and tamper-proof, ensuring that the data is safe from any manipulation.
- Real-time tracking: The app allows real-time tracking of attendance, which means that employers can monitor the attendance of their employees in real-time and take necessary actions as needed.
- Easy integration: The app is designed to be easily integrated into any organization's existing HR systems, making it a convenient solution for organizations of any size.
- Location-based tracking: The app includes a geo-fencing feature that ensures attendance can only be captured within a specified location, preventing fraudulent attendance records.
- Overall, the app provides an efficient, accurate, and secure way of tracking employee attendance that can benefit any organization.

Thank You!