



Vivekanand Education Society's Institute of Technology

(Autonomous Institute Affiliated to University of Mumbai, Approved by AICTE & Recognised by Govt. of Maharashtra)

NAAC accredited with 'A' grade

Certificate

This is to certify that the project entitled “**Crime Alert App**” has been successfully completed by Mr. **Avan B. Shetty** (Class **D15C**), a B.E. (Semester VI) Information Technology student at Vivekanand Institute of Technology. He has satisfactorily fulfilled the requirements of the Mobile Application Development and Progressive Web Application Lab course under my supervision during the academic year 2024-2025, meeting the project obligations for his degree

Subject Teacher
Mrs. Dipti Karani

Date: / /2025

Contents

1	Introduction	3
1.1	Introduction	3
1.2	Literature Survey	3
1.3	Problem Definition	4
1.4	Objectives	4
1.5	Proposed Solution	4
1.6	Technology Used	5
2	Design and Implementation	6
2.1	Requirement Gathering.	6
2.2	Proposed Design	6
2.3	Architectural Diagrams	7
2.4	Implementation	8
3	Results and Discussion	11
3.2	Result Analysis	11
4	Conclusion	11
4.1	Conclusion	11
4.2	Future Scope.	12
5	References	12

1. Introduction

1.1 Introduction

The Crime Alert mobile application is a revolutionary solution designed to address public safety concerns by enabling real-time crime reporting, tracking, and emergency communication. Built using Flutter, the app offers a user-friendly interface that integrates seamlessly with Firebase for authentication, data storage, and media handling, as well as Google Maps for location-based services. The application empowers citizens to actively participate in community safety by reporting crimes, viewing alerts on an interactive map, managing profiles, and sending SOS messages during emergencies. Crime Alert aims to bridge the gap between traditional crime-reporting methods (e.g., phone calls or visits to police stations) and modern technology.

1.2 Literature Survey

Prior systems include a web-based platform using Java2 for online crime reporting, limited to specific Windows versions; a mobile-based Automatic Immediate Crime Report System using radio waves for police communication; and a cloud-based system with electronic certificates for secure reporting. These highlight the need for a system combining rapid, anonymous reporting with immediate police response, which the proposed system addresses.

Papers Referred:

1) An Automatic Crime Reporting and Immediate Response System

Name of authors: Kefilwe Mkhwanazi, Pius Adewale Owolawi, Temitope Mapayi, Gbolahan Aiyetoro

Problem statement:

The paper addresses high crime rates in South Africa are underreported due to absent law enforcement, fear of retaliation, identity exposure concerns, and insufficient evidence. Existing systems lack informer anonymity, data integrity, and rapid police response, necessitating a secure, user-friendly solution for anonymous reporting and immediate action.

Methodology:

The Crime Reporting System (CRS) integrates a mobile app (C#) for anonymous or identified reporting with photo/video and location capture, a web interface (ASP.NET Razor, C#) for case registration, and a Raspberry Pi device (Microsoft IoT, ASP.NET) in police vehicles for real-time crime details and Google Maps navigation. Technologies include Visual Studio, JavaScript, Ajax, SQL Server

2016, Azure Blob Storage (99.9% evidence accuracy), Azure Service Bus, and SignalR. Reports are queued, validated, and assigned to police based on distance, time, and priority (1-5 scale), prioritizing severe crimes..

Conclusion:

The Automatic Crime Reporting System (CRS) enhances South Africa's crime reporting and police efficiency with 3-4 second reporting, 4-second notifications, and real-time navigation. Anonymous reporting and encryption ensure informer safety, while 99.9% evidence quality and 97% location accuracy support investigations. Though under-resourced police departments may face transition challenges, strategic planning and phased implementation can overcome barriers. Ongoing investment in digital tools is vital for sustained crime reduction and public safety.

1.3 Problem Statement

The primary issue addressed by Crime Alert is the lack of an efficient and accessible platform for reporting crimes and receiving real-time alerts. Many communities face challenges such as delayed reporting, insufficient awareness of nearby incidents, and limited access to emergency services. Additionally, there is a need for a centralized system where users can share information about crimes and collaborate on community safety initiatives

1.4 Objectives

The main objectives of the Crime Alert application are :

- To provide a platform for real-time crime reporting.
- To display crime alerts on an interactive map for better situational awareness.
- To enable users to manage their profiles and update personal information.
- To facilitate emergency communication through an SOS messaging feature.
- To encourage community participation in crime prevention through a post feed.

1.5 Proposed Solution

Crime Alert addresses the identified problems by offering a feature-rich mobile application with the following components:

1. Real-Time Crime Reporting: Users can submit detailed crime reports, including location, type of crime, description, and evidence.
2. Interactive Map: Crime alerts are displayed on a Google Maps-powered map with markers indicating reported incidents.

3. User Profiles: Users can manage their profiles, update personal information, and upload profile pictures.
4. SOS Messaging: An emergency SOS feature allows users to send distress messages to predefined contacts or authorities.
5. Post Feed: A community-driven feed enables users to share posts related to safety and crime prevention.

The application leverages Firebase for backend services, Google Maps API for location-based features, and a custom SOS Messaging API for emergency communication.

1.5 Technologies used

- Frontend Framework: Flutter (Dart)
- Backend Services: Firebase (Authentication, Firestore, Storage)
- Location Services: Google Maps API, Geocoding API
- Media Handling: Image Picker, Flutter Image Compress
- UI Enhancements: FlutterToast, Intl
- Custom API: SOS Messaging API for sending emergency messages

3. Design and Implementation

2.1 Requirement Gathering

1. Interviews of the reporters found online with blogs or news
2. Surveys of potential users (200 respondents)
3. Analysis of existing crime reporting systems
4. Review of public safety mobile applications

2.2 Proposed Design

The application follows a modular architecture with the following components:

1. Views: Screens for crime reporting, viewing alerts, managing profiles, accessing the post feed, and sending SOS messages.
2. Models: Data structures for storing crime reports, user profiles, and posts.
3. Services: Integration with Firebase, Google Maps, and custom APIs.
4. Widgets: Reusable UI components for consistency across screens.

Key Features and Their Implementation:

a. Crime Reporting:

- Users fill out a form with details such as location, type of crime, description, and evidence.
- Evidence (images/files) is uploaded to Firebase Storage, and metadata is stored in Firestore.

b. Real-Time Alerts:

- Crime reports are stored in Firestore, and markers are dynamically added to the Google Maps widget.
- Users can view incident details by tapping on markers.

c. Profile Management:

- User profiles are stored in Firestore, and profile pictures are uploaded to Firebase Storage.
- Users can update their profiles through a dedicated screen.

d. SOS Messaging:

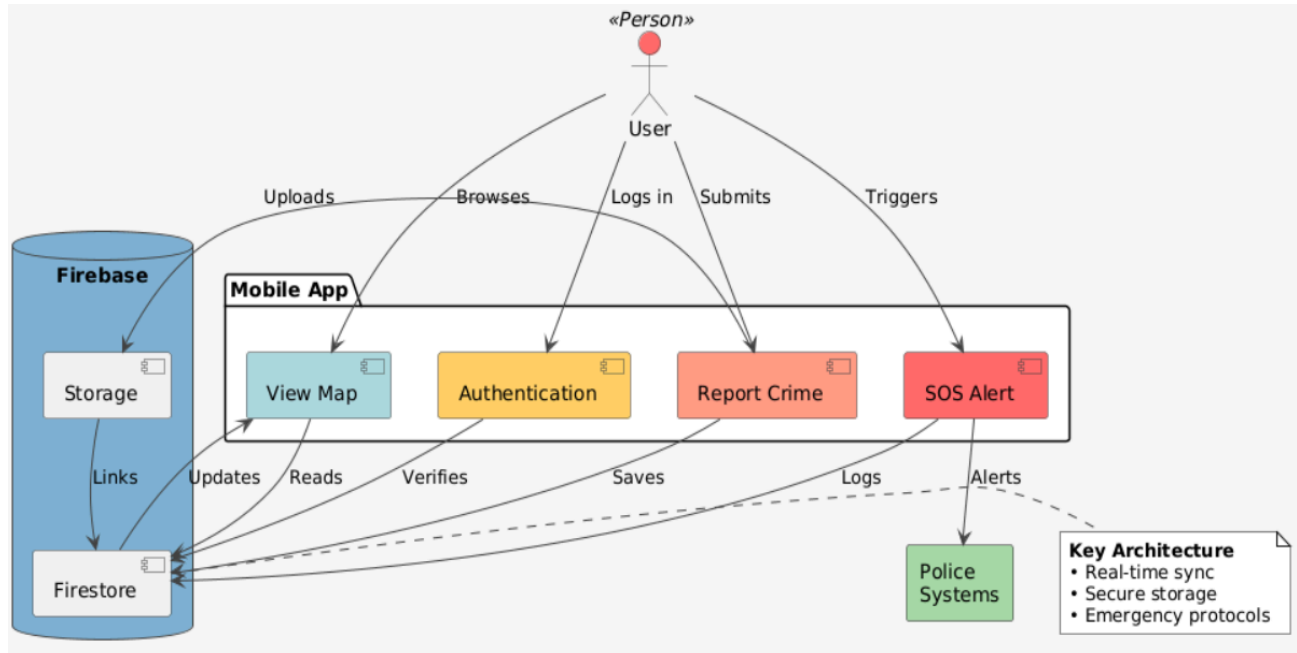
- A custom API hosted at <http://192.168.156.1:5000/send-sms> is used to send SMS messages.
- The API receives the recipient's phone number and message content as input and returns a success status.

e. Post Feed:

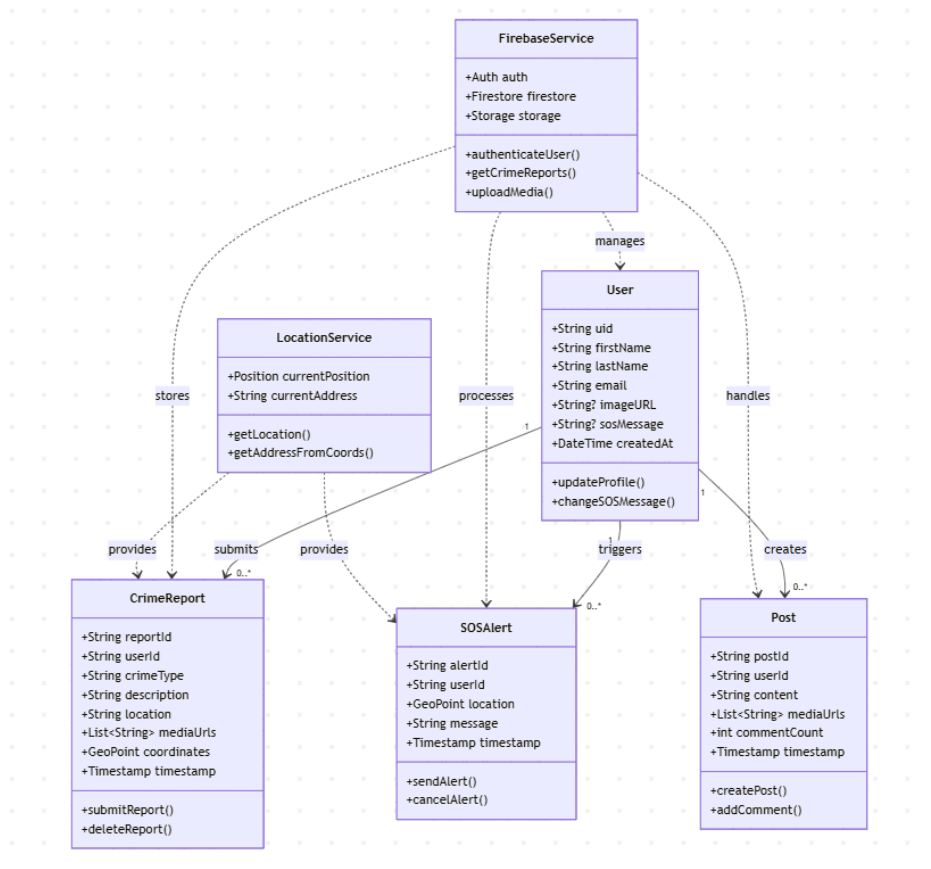
- Posts are stored in Firestore, and users can create new posts or view existing ones.
- Each post includes the author's name, timestamp, and content

2.3 Architectural Diagram

2.3.1 System Flow

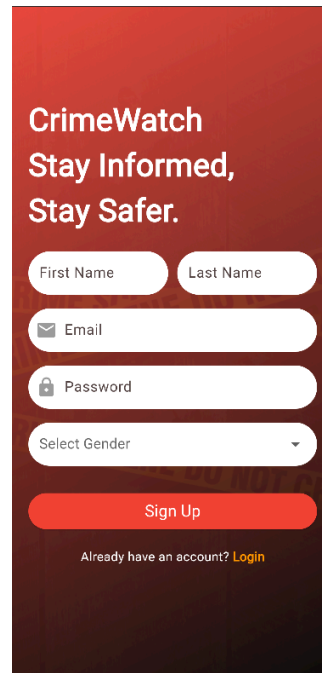
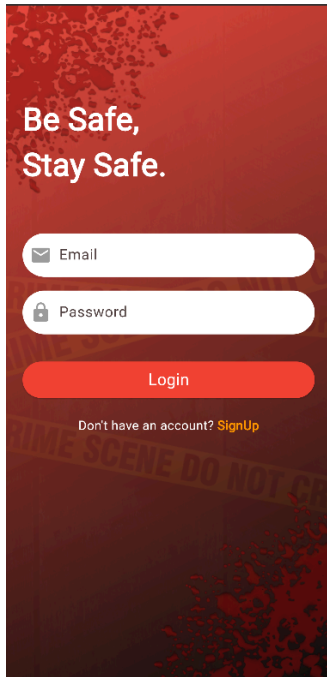


2.3.3. Class Diagram

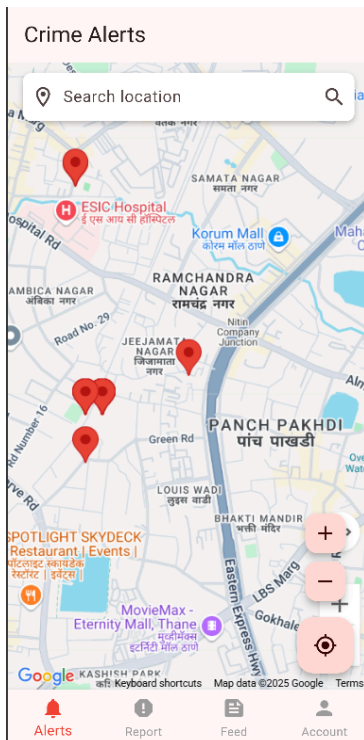


2.4 Implementation:

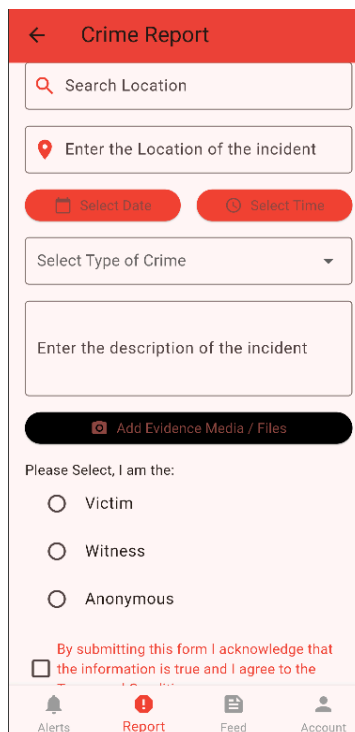
1) Login screen/Signup screen



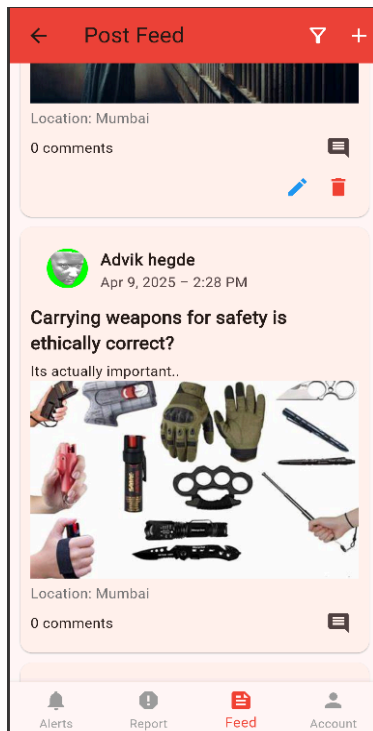
2) Alerts Screen



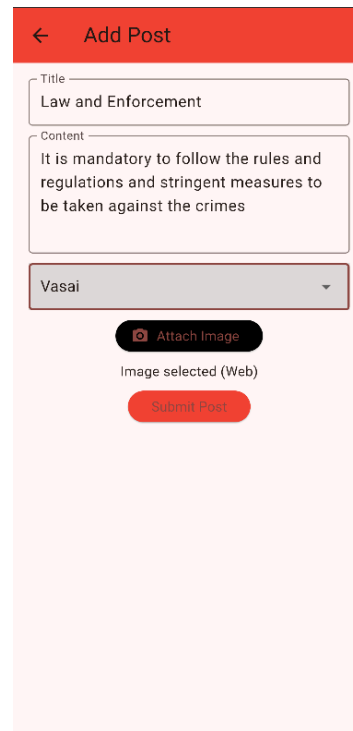
3) Report Crimes



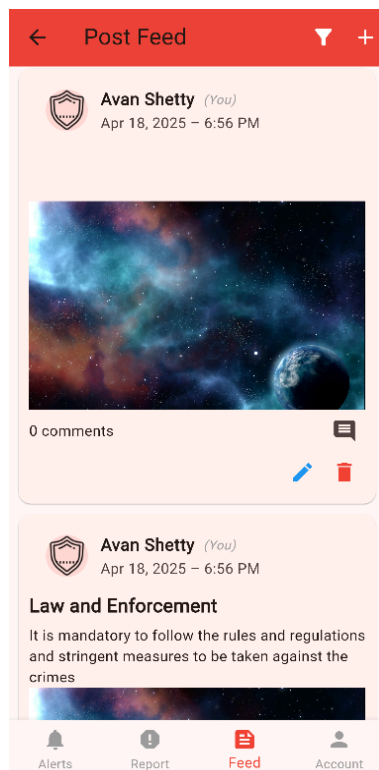
4) Feed Screen



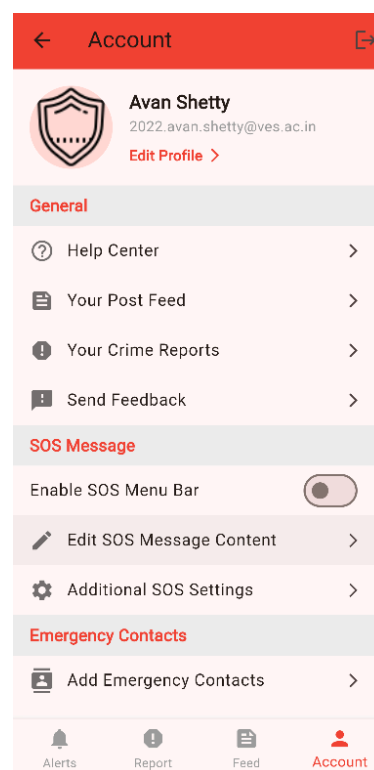
5) Add Post



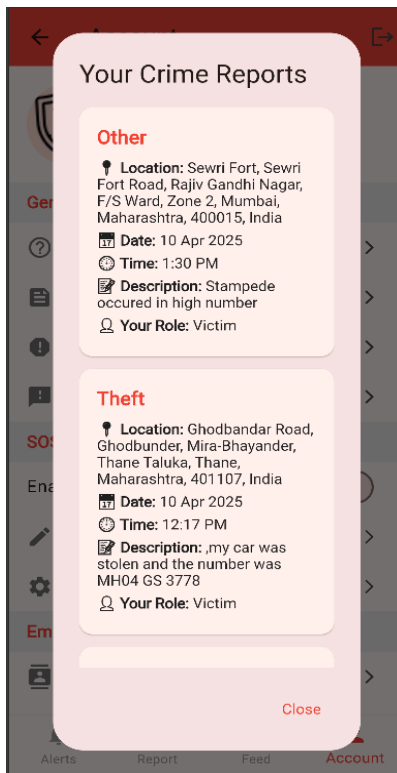
6) Filtered Posts



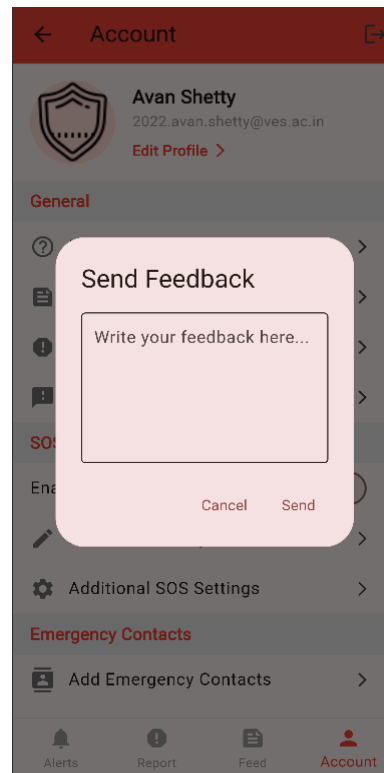
7) Profile Page



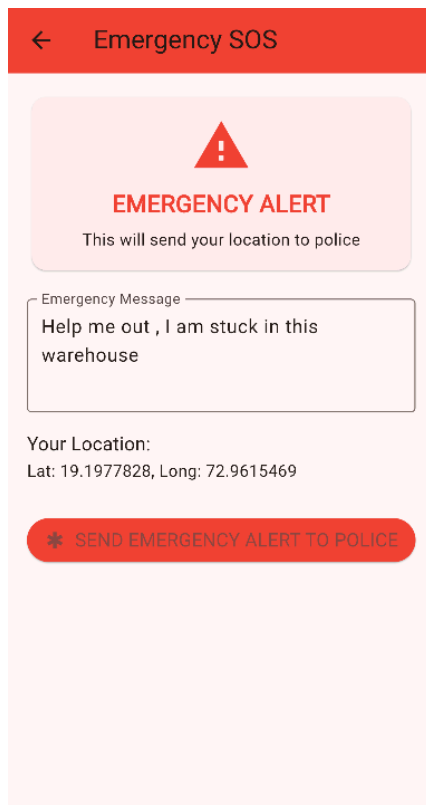
8) List of Crime reports



9) Send Feedback



10) SOS emergency



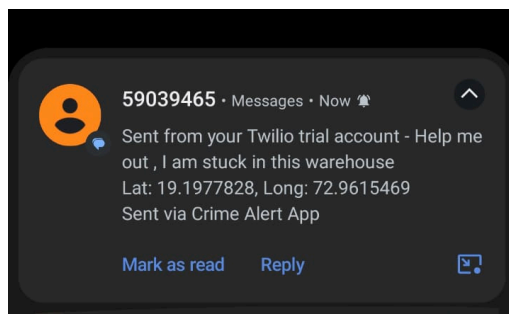
3 Results and Discussion

3.1 Result Analysis

The Crime Alert application successfully fulfills its

1. Crime Reporting: Users can submit detailed crime reports, including attaching evidence.
2. Real-Time Alerts: Crime alerts are displayed on an interactive map with markers indicating reported incidents.
3. Profile Management: Users can update their profiles and upload profile pictures.
4. SOS Messaging: Emergency messages are sent reliably to predefined contacts or authorities.
5. Post Feed: The community-driven feed fosters collaboration and information sharing.

Also successfully sends the email and the SOS message to the respective police division



4. Conclusion

4.1 Conclusion

The Crime Alert application represents a significant advancement in addressing public safety challenges through innovative technology. By leveraging tools such as Flutter for cross-platform development, Firebase for secure backend services, Google Maps for location-based features, and custom APIs for emergency communication, the app successfully integrates real-time crime reporting, situational awareness, profile management, and community engagement into a cohesive and user-friendly platform. Designed with a focus on accessibility and functionality, the application empowers citizens to take an active role in crime prevention while fostering collaboration between individuals and law enforcement agencies.

4.2 Future Scope

While the current version of Crime Alert is robust and functional, there are several avenues for future enhancement:

1. **Predictive Crime Analysis:** By integrating machine learning algorithms, the app could analyze historical crime data to identify patterns and predict potential crime hotspots. This would enable users to take preemptive measures and help law enforcement agencies allocate resources more effectively.
2. **Offline Functionality:** Expanding the app's capabilities to function offline would make it accessible in areas with poor or no internet connectivity, ensuring that users can still report crimes and access critical information even in challenging environments.
3. **Multilingual Support:** Adding support for multiple languages would broaden the app's reach, making it accessible to non-native speakers and fostering inclusivity.
4. **Advanced SOS Features:** Enhancing the SOS messaging feature to include voice calls, video messages, or even live location sharing would provide additional layers of security during emergencies.
5. **Gamification Elements:** Incorporating gamification features, such as rewards or badges for active participation, could incentivize users to engage more frequently with the app and contribute to community safety initiatives.

5 References

- [1] K. Mkhwanazi, P. A. Owolawi, T. Mapayi and G. Aiyetoro, "An automatic crime reporting and immediate response system," 2020 International Conference on Artificial Intelligence, Big Data, Computing and Data Communication Systems (icABCD), Durban, South Africa, 2020, pp. 1-6, doi: 10.1109/icABCD49160.2020.9183837
- [2] N. Sunanda, D. Shravya, A. Pravalika, D. Amulya and K. P. Saffronia, "Crime Detection and Geospatial Alert System using LRCN and Streamlit for Smart City Surveillance," 2024 4th International Conference on Sustainable Expert Systems (ICSES), Kaski, Nepal, 2024, pp. 1424-1432, doi: 10.1109/ICSES63445.2024.10763102.