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Women Safety Application Using Firebase and Geocoder

Vijaya Kumar[1], Kannan Mrithunjai[2], Mohamed Sharbudeen[3]

[1]Associate Prof., R.M.K ENGINEERING COLLEGE, TIRUVALLUR, INDIA
[2]UG Student, Department of CSE, R.M.K ENGINEERING COLLEGE, TIRUVALLUR, INDIA
[3] UG Student, Department of CSE, R.M.K ENGINEERING COLLEGE, TIRUVALLUR, INDIA

Abstract - *SAFE APP aims in providing safety and security to women and children by live tracking them and sending information to their parent or guardian. This application provides communication to the Emergency Contact through instant Phone call that is built within the Application. This Application also facilitates instant Messaging to Emergency Contact. This Android application live tracks location of the Women or the child using Firebase Real Time Database for Real Time Live Tracking. Using Geocoder Class in the Android framework location APIs we can convert an address to the corresponding geographic coordinates. Alternatively, we have converted the Location Co-ordinates to Address using the Reverse Geo-Coding.*

***Key Words*: GPS, Text message, Click to Call, Firebase Real Time Database, Reverse Geocoding, Google Maps API.**

1.INTRODUCTION

In today's world it is very unsafe to travel alone, especially for women. They have to travel alone in many cases, and for that reason we need to understand and develop a solution for women, so they should not feel any fear regarding their safety. This presentation represents an android application which will serve the purpose to safeguard the women from adverse situations. Every person carry their smartphones and the uses of android applications have been increased rapidly, so it is better to have such an android application which will provide a safe environment. SAFE app aims in providing safety and security to women by live tracking them and predicting the threat levels and sending information to their parent or guardian. This application also provides instant communication to the nearby Emergency Contact and also facilitates messaging to them. Based on the threat levels different security measures are initiated which ensures that Women is SAFE.

2. METHODOLOGY

The General methodology of this Application is classified as General Working and Internal Working.

2.1 GENERAL WORKING

This app continuously gets the location and send it to registered contact. So that we can easily track the user and it will also send the location. This Location can be viewed in the Maps which shows the exact Location of the user. SAFE app live tracks location of the women or the child using FIRE BASE for real time tracking. It allows the Women/child to Call the Emergency contact in case of emergency with a single click. It also includes instant messaging services where the women/child can send messages to their close Friend, Relatives in case of any Panic situation. It provides the Area, city and State Information in case of when the User Stuck in an unknown location using Geocoder.

2.2 INTERNAL WORKING

Initially upon the installation the users can login using their Email id and password that is registered in the Firebase Real Time Database. The Authentication Mechanism is carried out by the Firebase. After the successful Login the Users that are Available Online is made visible to Users, which means that they are ready to be tracked. The Required User's Id must be clicked in order to track that particular user which takes them to the Google Maps Activity, that shows the exact Location of the user. This Location is indicated by the Marker on Maps, wherein this Marker gets updated when the user displaces. It also provides the Join and the Logout Options where the user can go to the Offline mode when required. Further it provides the Instant message feature which sends the template to the Emergency Contact. Click to call button the instantly calls the Emergency Contact via Phone Call. Get My Location Button gives the Area, City and the State Description in-case of when the user stuck in an Unknown Location using the GeoCoding.

3. SYSTEM ARCHITECTURE

The System Architecture for the Android Application illustrated as follows.
This Architecture includes the User Interface, the features and the Key Functionalities of the application and also the Backend Fire Base Real Time Database working that lists the Online Users and also collects and displays the Latitude and Longitude positions of the users.
The Authentication process is also carried by the Firebase Real Time Database application.

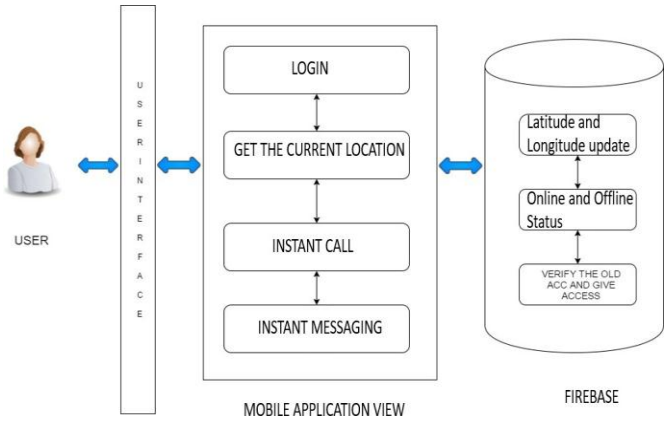


Fig -1 Safe Application System Architecture

4. DATA FLOW DIAGRAM

4.1 Data Flow Diagram for the Instant Messaging Feature

As the User Clicks the Instant Messaging Button the Messaging Function gets initiated and the message is sent to the Recipient.

Fig-2 DFD of Instant Messaging

4.2 Data Flow Diagram for the Click-to-Dial Feature

As the User clicks the Instant Call Button the Call is initiated to the Emergency Contact.

Fig-3. Click-to-Dial

4.3 Data Flow Diagram for the Live Tracking

As the User Opens the SAFE Application, the User Login to the Application, after giving the Login credentials, the Firebase Authentication Takes place. After the successful Login the User Id gets added to the Online List and the Latitude and the Longitude of the User is obtained and it is stored in the Firebase. Upon clicking the User's id the Application takes to the Map Activity which Displays the Current Location of their friend and these marker on the map moves as the user moves through.

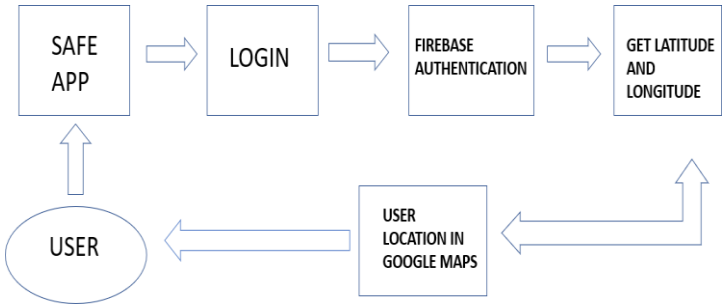


Fig-4. Live Tracking

5. CASE STUDY

1) VithU App:

VithU, is an emergency Application that, when you press the power button of your Smartphone 2 times, it begins sending out alert messages every 2 minutes to your contacts that you feed into the app as the designated receivers or guardians.

2) The stun gun:

This small gun charges an attacker with an electric shock. The shock weakens the attacker temporarily, giving you sample chance to escape the scene. They run on Lithium batteries and can be carried either in handbags or held in waist straps.

Disadvantages:

These above seen applications are not provided with the Live Location Tracking and More Over it does not provide any feature to communicate with the Emergency Contact either via Messages or Phone Call.

5.1How our Proposed System overcomes this Disadvantages

- This app continuously fetch the location and send it to registered contact. So we can easily track the user and it will also send the location.
- This Location can be viewed in the Maps which shows the exact Location of the user, SAFE app live tracks location of the women or the child using FIRE BASE for real time tracking

- It allows the Women to Call the Emergency contact in case of emergency with a single click.
- It also includes instant messaging services where the women/child can send messages to their close Friend, Relatives in case of any Panic situation.
- It provides the Area, city and State Information in case of when the User Stuck in an unknown location using Geocoder.
- It is User Friendly
- It gives the Exact Location

6.EXISTING SYSTEM

- The Drawbacks of the existing system is when emergency situation occurs the user cannot seek for immediate response when they are in risk situation.
- Cannot pass their location to friends and family members to intimate they are in risk.
- Some of the existing comprises of different buttons based on the seriousness of a situation.
- So, you can tap the one you want depending on your situation, which may not be suitable for the real time situation

7.IMPLEMENTATION

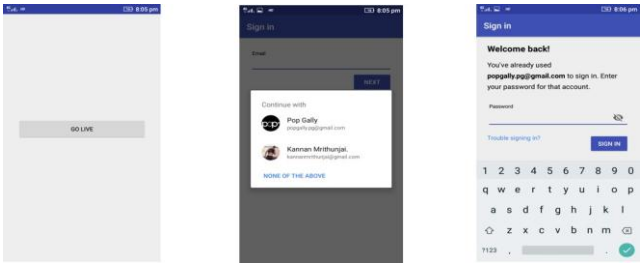
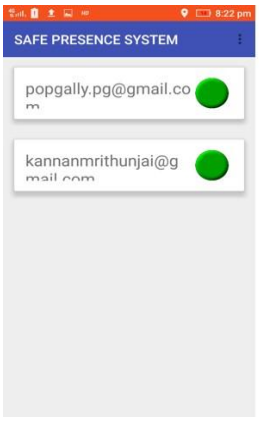
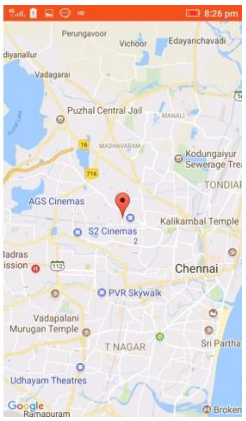


Fig. 5. FireBase Authentication

- This above screenshots illustrates the Login and Authenti- cation mechanisms that were implemented using the Firebase Real Time Database.
- Once the User is successfully Logged in it shows the List of Users that are present Online and on clicking the ID of the User to be tracked it takes them to the Maps Activity which displays the exact location of the User that are marked by the Marker in the map.
- Further the Map Application implemented as follows
- It also lists the Number of uses that are present online





8.PLATFORM REQUIREMENT

8.1. Software Requirement

- Android studio
- A flexible gradle based system.
- Build variants and multiple apk file generation.
- Code templates to help you build common app features.
- A rich layout editor with support for drag and drop theme editing.
- Lint tools to catch performance, usability, version com- patibility, and other problems.
- JDK(Java Development Kit) 7
- JRE(Java Runtime Environment)
- Windows or Linux Operating system

8.2. Hardware Requirement

- RAM : 4GB minimum or more
- Processor : Intel i3 minimum or more
- Disk Space : 500 MB for Android Studio , at-least 1GB for Android SDK

9.CONCLUSION

SAFE app is the best app to inform and update your close ones if you are in an unsafe place. The app is the fastest and easiest way to update your close ones about your location and other details. You will never feel unsafe with this app. Keep it installed and stay alert.

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