Guardian – A Women Safety App

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Abstract: *From time to time, we all find ourselves in situations where we feel unsafe or under threat. Random assaults, kidnappings, rapes and even occasional murders make headline news on an all too regular basis. Personal security for themselves and for loved ones has just become an issue of concern for just about everyone in today's world.*
The perpetrators of such crimes ate often emboldened by the belief that they can get away with their violent actions, unidentified and unpunished. Even survivors of violent attacks are often too traumatized by their experience to clearly identify their attackers. In this technological world, there is an urgent need of a way which can help prevent this.
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Keywords: *Women safety, personal safety, android application, location tracking, audio/video recording, sos messaging.*

I. Introduction

Have you ever felt unsafe when walking alone at night, or have you ever worried about how you actually would get help in case of emergency?

The answer to first question can be found in various statistics taken all around the world. One of the trusted data survey agency named Gallup took a survey on how many people feel unsafe at night in U.S.A and the results were staggering. 37% of the U.S population felt unsafe at night and 45% of them were women who felt unsafe even for walking alone at night.

This is just the tip of the iceberg followed by mind boggling statistics. According to a non-profit organization named Rainn, on average, there are 321,500 victims (age 12 or older) of rape and sexual assault each year in the United States and in every 98 seconds an American is sexually assaulted.

The statistics doesn't get any better for other countries as well. In India, according to UN Women statistics, lifetime physical and/or sexual intimate partner violence is 29% in and the lifetime physical and/or sexual intimate partner violence in last 12 months is 22%.

Technology has existed for a long time and has advanced and evolved into ubiquitous handheld mobile devices. Application is a piece of code that runs on this mobile devices. Android is like an operating system which runs on majority of the mobile device till date. Guardian is an application which runs on android covering a majority of population.

The salient features of Guardian is:

1. Designed with the focus to run on every type of mobile device irrespective of the hardware that runs on android powered system.

2. The user interface is designed on the idea of the position the victim would be in an unfortunate situation and what would be the most convenient way to access the phone. Following this idea, the app has two components:

- The widget which is for emergency. The user has to one tap the widget to activate emergency services.
- The main application which has all the significant features in addition to emergency services add contacts, fake call, tips and tricks for safety and also location tracking and audio/video recording.

3. Ease of access, time management and resources utilization were majorly focussed while developing. The application provides notification to the user for easy and efficient use of services. It also locates and caches the location at the start of the application for a certain period of time saving the significant amount of time used to track the location again. This in turn saves the battery and hence resource utilization.

4. Designed not just for emergency services. Besides emergency services, the application has features like Fake call to help get out of a tricky and unwanted situation. As the saying goes, prevention is better than cure, there are tips and tricks for preventing unwanted situations by making person aware of self-defence techniques and in general making more prepared for any unwanted situation.

II. Existing Systems

There are plenty of women safety systems available on play store. Two things all the applications have in common is location tracking and emergency service to try placate the situation by alerting the police, by sending location details to the loved ones or by triggering an alarm or sound of some kind to scare the criminal. Few of the systems are mentioned below:

1. **Abhaya:** Created by alumnus of Vignan University, Guntur, thisapplication focuses on continuous location tracking and continuous message sending with the location coordinates every 5 minutes. This is beneficial especially in the case where the user cannot access the phone easily and wants to re-send the message. This has some major flaws as the each message sending and re sending comes at a cost- monetary and time.
2. **Woman Safety:** This application is lightest and fastest to use as it does not provide location tracking and other features. It provides user with various sos message templates to choose amongst and then set emergency contacts to whom the message would be sent. It is created by DTons Solutions as a way of providing user with the most convenient and lightest application. For using the application, the user does not even have to go the registration and login process.
3. **Chilla:**This application takes a different approach to tackle the emergency situation. The belief is that in times of emergency, a person rarely opens the phone and contacts police or loved ones instead the instinctive response is to shout and scream. This is what is used in the application. The app constantly waits and listens for scream. The moment a scream is heard, it triggers the emergency services and in turn sends emergency message to the selected contacts.
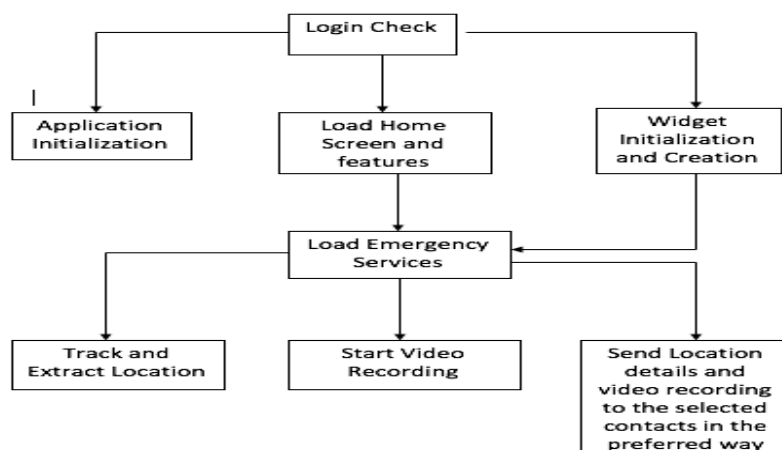
III. Proposed System

The proposed system is a piece of code that runs on android operating system and provides user with features to safeguard themselves from any unfortunate situations. The system is divided in multiple modules with each module carrying their functions and few common functions. The modules can be divided into:

1. **Login Module**: Login is necessary for authentication and verification of a user. Guardian has a module for the same purpose. The login module is the first module to run when the app starts. It executes the following tasks:-
a. At the initialization, if user is first time user then they are redirected to login page. Else. this module checks the local files created by guardian at the initialization to find out if the user in attention has already logged in through that same android system anytime. If user has logged in then the user is all set and good to go and will be redirected to the home page. If the user has not logged in or logged out then they will be redirected to login page to login again.

2. **Emergency module:** This module comes into the picture only when emergency services are triggered. The emergency module strives hard to consume least amount of resources and time and provide the functionality in a reliable and efficient way. The module makes use of redundancy to achieve robustness and reliability. This module employs GPS and SMS Managers to use for location tracking and emergency message sending. When an emergency occurs, user makes use of emergency services in the application and the emergency service module starts.

IV. Working

The overview of the application workflow is described in the figure below

The figure depicts top-level application workflow. When the application is initialized it first contacts the login module. The login module processes the request and take actions appropriately. Once the user is logged in i.e. authenticated and verified, is redirected to the home page. The login module has following forms and options
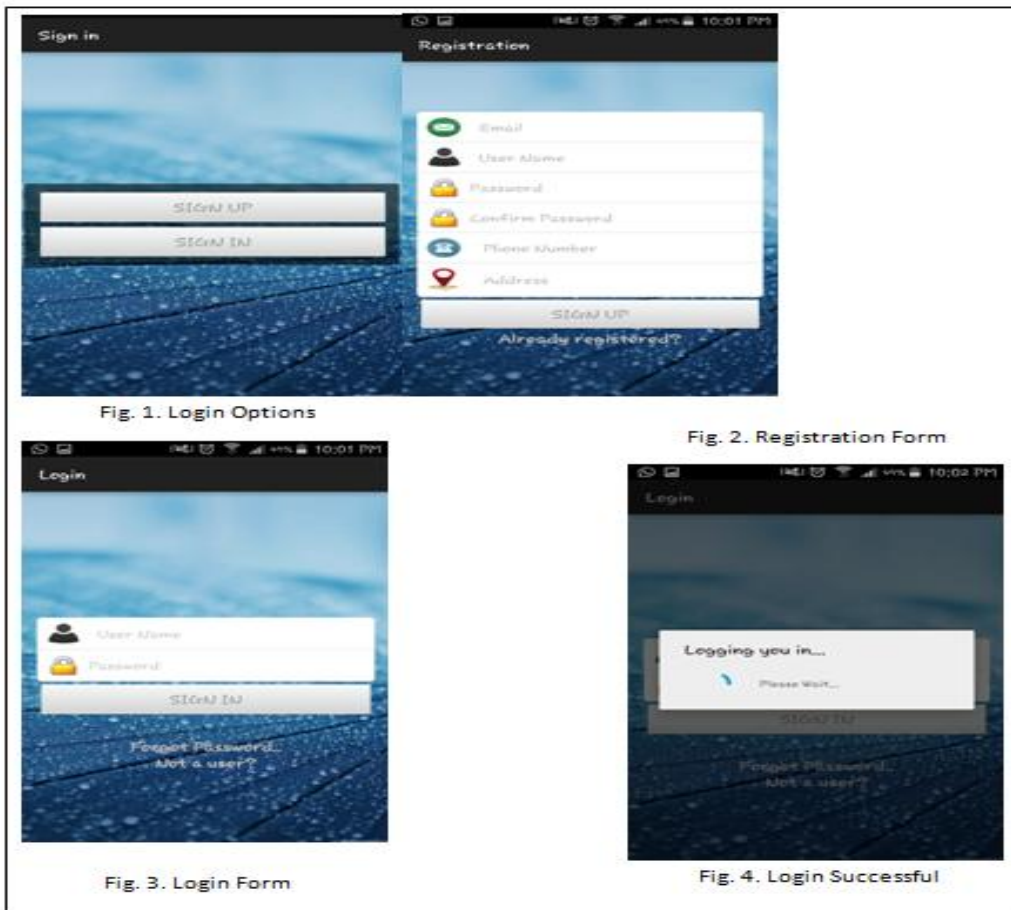

Fig. 1. Login Options

Fig. 2. Registration Form

Fig. 3. Login Form

Fig. 4. Login Successful

Figure A: Login Module with Forms

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Once logged in, this is the place called home screen and this is where user can access all the features of the application. Here, user is presented with a screen that shows the current location of user with the help of google maps. User can also enter emergency contacts to which the emergency message would be sent. The user can either pick a contact from phone or enter the number manually in the text field provided.The user can also set a custom message to be sent to the emergency contacts. The home page and the personal information section is shown in the figure below.
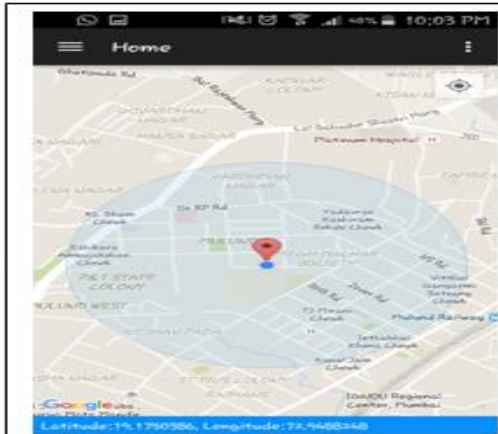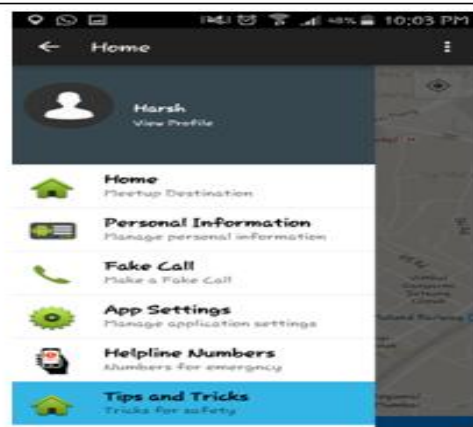
Fig.1. Home Screen tracking the location
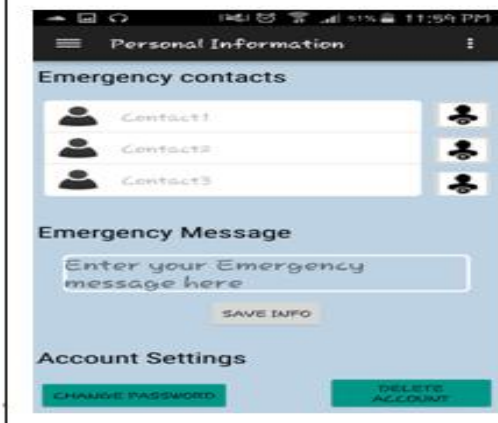
Fig. 2. Features of the application

Fig.3. Personal information section to add emergency contacts and message. Also has additional account settings

The side navigation bar provides a list of menu as seen in fig.2 of fig. B. This is where user can select various features of the application. The fake call is a feature of the application which can be used to set a fake call and get out of a difficult situation. The fake call section simply asks you contact name and number from which the fake call will be received. You can also set the timer after which you want the fake call to be activated. This is very helpful in places where the user already knows that they have to get out. The fake call section and the fake call itself looks like follows:
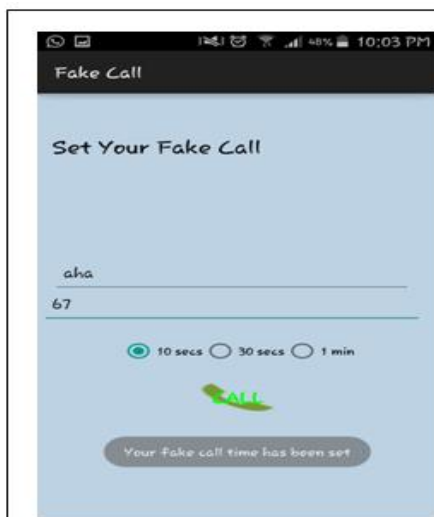

Fig.1. Setting fake call

Fig.2. Fake Call

Figure C: Fake call feature

It is generally seen that in an emergency situation panic takes precedence and person loses their calm. It makes harder to think and take right decisions. Similarly, it makes hard to search for contacts to help and contact. To tackle this, the application comes with pre-loaded helpline numbers. There are helpline numbers of non-profit organizations, women organizations and police stations for making a quick call reducing the hassle, effort and time wastage of searching for one. User should take defensive actions in any emergency situations. Tips and Tricks section helps the individual to learn tips to get out of a fatal situation such as neck lock etc., where and how to attack and to defend yourself. Tips and Tricks is simply a way to learn more about self-defence techniques. The app settings section is the place where user can decide how they want the emergency message along with location details and video to be sent i.e. via email or message. The said features can be seen in the figure below
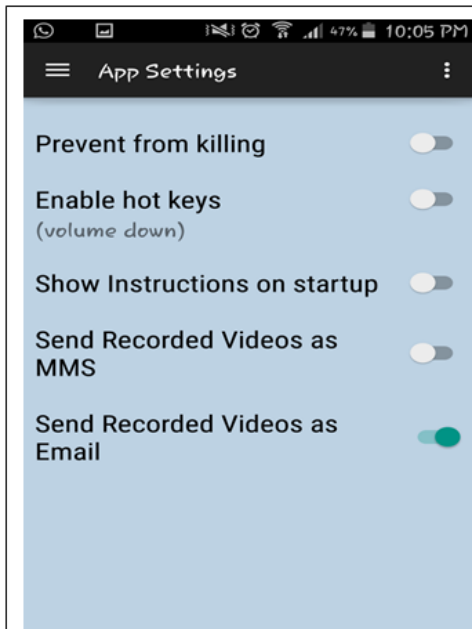

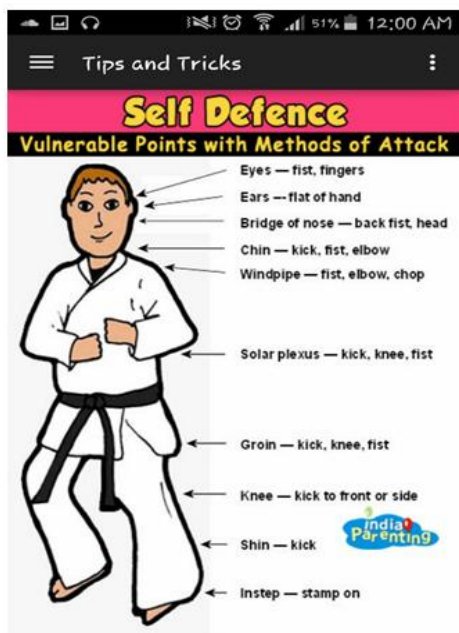
Fig.1. Application Settings

Fig.2. Helpline Numbers

Fig.3a

Fig.3b

Fig.3 a and b. Tips and Tricks

Figure D: Application Settings and Helpline Number Features

When in case of emergency, on the home screen, user can simply press volume down button to trigger the emergency service. If app is not started, user can set the application widget on their home screen and can one-tap it to activate emergency services. The emergency services start in conjunction with each other and work in parallel in the background. As soon as emergency service is called, it tracks location, records video and sends it to the emergency contacts. The emergency services run in background. Generally, GPS with video of the place gives more evidence and clue of the place where the potential victim is. Hence, Guardian records video but does it in background to save time and have phone ready for the victim to operate it.

V. Conclusions and Future Enhancements

Guardian not only tries it's best to protect the individual but also puts its best efforts to optimize resource and time. It is an exemplary piece of software for future technology integration. Not epitome, although it is one of the fastest application of its kind with significant attention on safety.

Future Enhancements:

* As the technology evolves, we aim to put more data analysis in the application to analyse sensitive and important piece of information and take preventive actions.
* This app is only designed for android systems for the time being. IOS development is next important step.
* The application is built in small independent modules and thus making it easier to develop each module independently and increase the functionality.

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