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ToGetHer Home Safe

(A community based, All-in-One, on Road Safety Application)

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Abstract - *In today's world, we are used to hearing news about heinous acts of crime against women. .In most parts of the world, it has become very unsafe for women, in particular, to travel alone. Many women have to travel and commute alone for their work and as the world grows and as women are getting more and more opportunities to work, their safety on roads also becomes a serious issue that needs attention. Woman security is a critical issue and it is much needed for every individual to act over such issues to safeguard them. This project proposes an android application that provides the tools and systems necessary to ensure the safety of women on the road and to try and save them from dangerous situations. We decided to host this project on an android application as it serves the purpose of reaching more number of people*

Key Words: **Android, Machine Learning, Firebase, Women safety, Places API, Map SDK**

1. INTRODUCTION

According to the reports given by WHO, 35% of women all over the world are facing a lot of unethical, physical harassment in public places such as railway-bus stands, footpaths, etc. Every 20 minutes a woman is raped in India. Every 18 hours a woman is raped in Delhi. A lot of NGOs, rehabilitation centres, and helpline numbers have been made operational in the past years, but they are all 'cures' to the harassment that has already happened and not the 'preventions' that we need.

1.1 Problem Statement

A study that polled over 500 women in cities across India stated that around 84 percent of the women respondents who experienced such harassment were generally aged between 25 and 35 years old and were largely working women and students. It is almost as if society is telling women that 'public spaces are not for them'. There is not a single day that goes by that women and young girls from all classes and castes are not molested and assaulted. So the problem here is that women aren't safe on roads and even in 2019 we get to see stats like the ones above. Many technologies have been made accessible in the market, but none have been effective enough to help the victims of such heinous acts.

1.2 Solution

This project aims at providing a community-based protection system that integrates many tools to provide a system that can help people under dangerous situations. The project is hosted on an android application with the intention of reaching more people as the number of Smartphone users has drastically increased in recent years. The app hosts many existing features in one place and has a few out of the box solutions to help a person in danger.

2. LITERATURE SURVEY

[1] Women's safety device and application. This paper proposes a method in which the android app and the device are synchronized using Bluetooth connection which helps to trigger them independently; both ARM controller and android app are used. It has the capability to record audio which can be used for further inquiries, it can also give a call alert messages to pre-set contacts with the user's location every two minutes and the user's track can be seen live. A hidden camera detector is also available and it is a very distinct feature used which ensures privacy.

[2] A mobile-based application for the safety of women. In this paper, a mobile application is used to know whether the user is safe or not. It provides an accurate location of the user at any point in time and has the capability to mimic fake phone calls from police to scare the attacker.

[3] Advanced Security system for women. The paper proposes an automated highly reliable women security device that consists of advanced sensors embedded in a wearable dress. It consists of advanced sensors and ATMEGA8 microcontroller with Arduino tool which keep user under observation at all the time. It monitors the heartbeat rate, temperature, and vibration in the body through sensors to check for uneasy situations.

[4] Woman safety, the system has different sensors like heartbeat sensor, temperature sensor, and accelerometer sensor for detecting the heartbeat, temperature, and sudden change in motion of the user. GPS and GSM which will help to detect the location of the device and to send an alert message to guardians, relatives, and police station.

Camera data is processed and converting, resizing, and cropping, then face detection and recognition are performed. This development scheme is cheap, fast, and highly reliable

and Raspberry pi takes less power and provides enough flexibility to suit the need of various people.

[5] This paper proposes a mobile app which is named WoSApp (women safety app) that provides women with an efficient, easy, and reliable way of placing a call to the police during emergencies. The police and pre-registered contacts are sent to the user's location during an emergency.

[6] This paper presents an analysis review on the principle need of intelligence security systems with technology requirements and challenges to build a system. It minimizes the possibility of physical violence by keeping all the help tools ready to safely escape from violent situations.

3. PROPOSED APPROACH

3.1 Software Requirements

Android Studio

Android Studio is the tool which is officially used for integrated development of google's OS that is Android, the IDE is built on JetBrains' IntelliJ IDEA software and is designed specifically for the development of Android applications. It can be downloaded for Windows, macOS, Linux, and a subscription-based buying is also available. It replaced Eclipse Android Development Tools (ADT) as the primary IDE for native development of Android applications.

Firebase API

Firebase is Google's mobile application development platform which can help you to build, improve, and grow your app forward. It provides a toolset to "build, improve, and grow your app", and the tools it gives you include a large portion of the services that developers don't want to build but have to cause they are not readily available because they'd rather be focusing on the app experience itself. Things like analytics, authentication, databases, configuration, file storage, push messaging, and many more are included in this. The services are hosted in the cloud and scale with little to no effort needed by the developer.

Places API

The Places API is a service provided by Google. It returns information about places with the help of HTTP requests. Establishments, geographic locations, or prominent points of interest are defined in this API.
The following place requests are available:

•Place Search is used to return a list of places based on a user's location or the search string entered by the user.
•Place Details is used to return more detailed information about any specific place, including reviews about the place given by users.
•Place Photos is used to provide access to the millions of place-related photos that are stored in Google's Place database.
•Place Autocomplete service automatically fills in the name and/or address of a place as the users type.
•Query Autocomplete is used to provide a query prediction service for geographic searches which are text-based, returning suggested queries as users type

Maps SDK

The Maps SDK is a toolkit of android which returns helpful data about places and locations. JavaScript is used to provide the functionality.
There are two major things that it does:
It makes the map appear to the users. It can return data about a location fed using latitude and longitude, or return data about an address fed to it.

3.2 Hardware Requirements

For developing the project:

Processor: Intel i5 onwards

Memory: 2.00 GB RAM

Hard Disk Space: 20GB

Keyboard: Standard Windows Keyboard

For end-users:

A Smartphone with Android OS with a version higher than Kitkat 4.4.

3.3 Methodology

The proposed methodology is as follows:

The application will have all the tools necessary for a user during dangerous situations. It has the basic Alert button which when pressed while performing a series of functions that will collectively help the user to get out of the situation unharmed.

When the user opens the app for the first time, he has two options, SIGN IN and REGISTER. If you are already a user then he/she has to enter their email and password and select SIGN IN. If you are a new user then enter a new email and password and select REGISTER.

REGISTER:

The user is asked to enter a few details when the user selects the register option. The user is asked to enter his/her full name, home location, parent's full name, parent mobile

number. When the location icon is clicked the current location is saved as home location.
The user is asked for his/her normal commute timings to monitor his travel time.
All of this data is stored in the Firebase API.

The Application keeps track of the user's current location at all times, it uses map SDK to do so. If the user does not reach home at the given time, it shows a red alert on the screen, if the user doesn't confirm his safety within a given period of time, the emergency actions are taken.
NEARBY THREAT STATUS button is used to notify about the threats around the user. If there is a threat it is displayed in red font color or else it will be displayed in green color.
NEARBY POLICE STATION button is used to find the police station around the user in a radius of 2 km and if there are no police stations then it is displayed in red. In case of emergency, the user is provided with the option to enter the station name to navigate.

In HELP ZONE user is provided with four emergency calls.
CALL POLICE STATION button is used to contact Nearby police station during an emergency.
CALL PARENT MOBILE button calls the registered parents number.
GET SUPPORT FROM US button will contact an app executive who will send help
.TAP TWICE TO SCREAM OUT LOUD, when the user taps twice on the screen it creates sound to scare the threat.

THE EMERGENCY BUTTON:
During an emergency, the user has the option to make the app amplify its volume and produce loud screaming noise. The user with a single button press can contact the emergency contacts which he/she has selected beforehand and also contact the nearby and home police stations. The user's exact location will also be shared with the contacts and police.

THE PROTECTOR COMMUNITY:
The users of the app are given an option to join something called a "Protector community". This group of volunteers is called Protectors who take an oath to protect fellow users and respond to their calls during an emergency. When a user presses the emergency button, the user's current location and threat status are sent o the protectors nearby in a specified radius. If no protectors found or if the protectors aren't moving towards the user, the radius is increased.

THREAT ANALYSIS:
The users of the application are surveyed frequently to collect information regarding the roads/areas they travel through. This data is used to calculate a safety score for each area/road which is an index of how dangerous the particular area/road is to travel through/to.

3.4 Result of Implementation

The following figures show the output of the application.

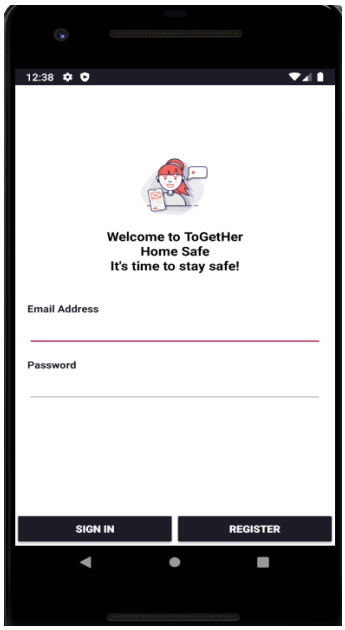

Figure 1 Login Page

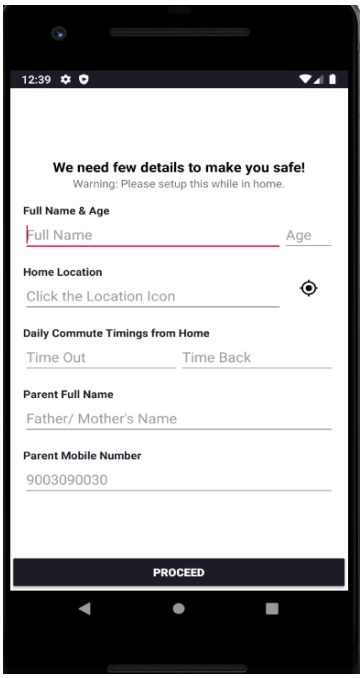

Figure 2 Registration Page

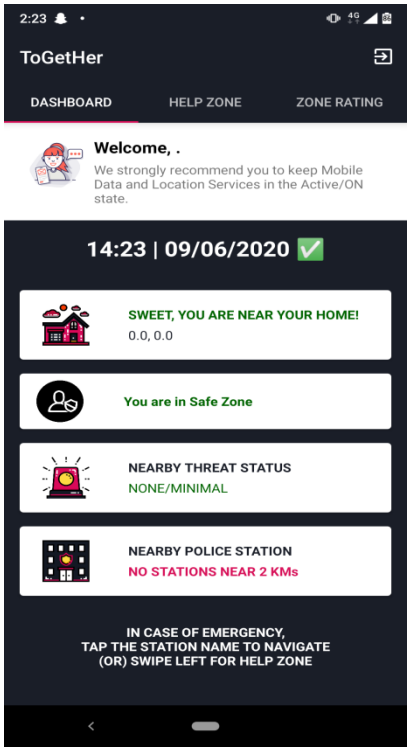

Figure 3 Dashboard

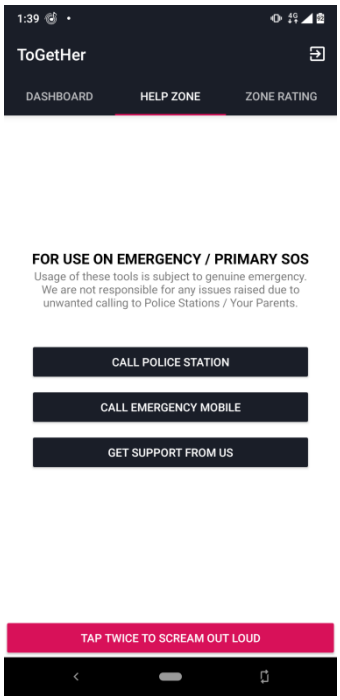

Figure 4 Help zone

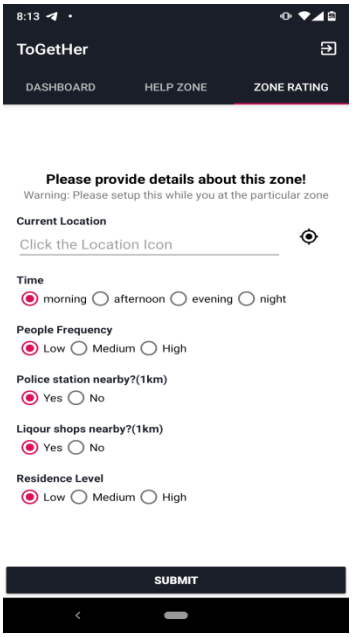

Figure 5 Zone rating

4. CONCLUSIONS

The application can be a lifesaver in dangerous situations and will also instill confidence in people to walk on roads at any time without fear. Gradually, as the application gets famous and is improved, this will also reduce attempts made to attack or rape someone as the chances of getting caught go high.

The application is simple and easy to use, parents can track their children's movements and make sure they are safe at any point of time and this provides a lot of freedom from the chains of safety. The number of rape cases recorded in India is high and that news has made the young population think about this, and most of them want to do something to be able to help stop this. The application uses this to the advantage and provides the option of a protector community where these motivated groups of people get to help and this increases the safety of users.

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