

Help Me Out! : Location Based Android Emergency Services

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Abstract – In this paper, we investigate how to network smartphones for providing communications in disaster recovery. By bridging the gaps among different kinds of wireless networks, we have designed and implemented a system called Help Me Out! which provides smartphones the capabilities of communications in disaster recovery. Specifically, Help Me Out! consists of two components: A messaging system and a self-rescue system. The messaging system integrates cellular networking, ad-hoc networking, and opportunistic networking seamlessly, and enables communications among rescue workers. The self-rescue system groups, schedules, and positions the smartphones of trapped survivors. Such a group of smartphones can cooperatively wake up and send out emergency messages in an energy-efficient manner with their location and position information so as to assist rescue operations. We have implemented Help Me Out! as a prototype application on the Android platform and deployed it on off-the-shelf smartphones. Experimental results demonstrate that Help Me Out! can properly fulfill communication requirements and greatly facilitate rescue operations in disaster recovery.

Index Terms – Help Me Out! , HMO, Emergency Services Using Location, Emergency Services, Aid to emergency.

1. INTRODUCTION

Mobile Health (m-health) is the practice of medicine and public healthcare supported by mobile devices. It is an emerging research field for healthcare systems of developing nations like India where high population growth, a high burden of disease prevalence are felt. Moreover, the flourishing growth of mobile phones and heavy requirement of emergency medical assistance pave the way to develop emergency medical healthcare applications.

Mobile health applications require an understanding of where consumers are, where they have been and where they are going. Wireless mobile devices can continually transmit device (user) location to such applications which can be used in a sensible way. The integration of location-sensitivity along with other information as to provide added value to a user is location based service (LBS) . So, location based service (LBS) provides information about surroundings of user with location-enabled mobile devices via GPS (Global Positioning System) or mobile phone network

On the other side, there has been an alarming rise in road accidents, significantly highway accidents, in India over the past few years. Lack of information about nearby hospitals, clinics, and diagnostic centers may cause the death of victims of the accidents. To face this type of medical emergency, people might have to know information about the healthcare facilities e.g. hospitals, clinics, and diagnostic centers around the place where the accidents occur. A new comer, a tourist, and a visually impaired person may face difficulty in having emergency medical help without this information

For this, we have proposed a location based emergency medical assistance system on mobile phone utilizing HELP ME OUT!(HMO). The main difficulty of our system was that the healthcare centers were not mapped in the country . We have taken the waypoints of healthcare centers (hospitals, clinics, and diagnostic centers) around cities and mapped on Map which is a rapidly growing open source map of the world. Location based medical assistance (LBMA) system which is also an Android platform based smart phone application to render location based services showing both brief and detailed textual information on the application as well as audio direction of healthcare points around current location for visually impaired people during any emergency situations.

For further assistance we have also made a website for more information about the application.

The website named www.helpmeout.ga one can go and check the details about the app.

2. LITERATURE SURVEY

The following are the existing systems in Personal Safety Application domain:

A. WithU

WithU is an emergency application which sends emergency alert messages to the stored contacts when the power button is pressed twice continuously. The alert message contains a link to the current location which is sent every two minutes.

The following are the advantages:

1. Provides safety tips during emergency situations. Crime Tweets.
2. Provides facility to submit the crime story of the user online.
3. Appealing UI.

The following are the limitations:

1. The messages sent to the stored contacts cannot be customized.
2. Lacks shake to alert feature.
3. Lacks integration with popular messenger services.
4. Lacks the feature of displaying the current location of the user on a map.

B. Watch Over Me

In Watch Over me safety application, the user has to add the contacts to whom the emergency messages have to be sent. The user has to set a time for the completion of a given journey which he travels. If the user does not check in to the location within the given duration of time, alerts are sent as emails, SMSs and notifications on Facebook to the stored contacts

The following are the advantages:

1. Location tracking throughout the journey for a specified duration of time.
2. Shake to alert feature. When the phone is shaken the camera is also started automatically and video recording is done.
3. push notification alerts regarding high crime rate areas.

The following are the limitations:

1. Continuous usage of GPS tracking reduces battery life. All features are not freely available. Some features are
2. available for a premium price.
3. Alerts regarding high crime rate areas are available only in the US.

C. Nirbhaya : Be Fearless

It is a personal safety application which sends emergency alert messages with the help of single click (soft key in the application) distress signal

It has the following advantages:

1. Geo fencing - the given contacts are alerted when the given demarcated boundary is crossed.
2. Stamping - Users can mark safe and unsafe areas in the map.
3. Alerts the application user when unsafe area is entered. Shake to alert feature - when the phone is shaken,

4. emergency messages are sent to contacts.

5. Alerts can also be made in the form of calls. Alerts can also be posted on Facebook.

The following are the limitations:

1. Non-appealing UI.
2. Does not integrate with popular messenger services to send alert messages

D. Safe Kerala

This application sends alert messages with a single touch to all the contacts stored

The following are the advantages:

1. SMS alerts.
2. Geo Fencing feature to set a virtual barrier. When this barrier is crossed, it alerts the contacts.
3. Feature to call emergency contacts with one touch tap. Appealing UI.
4. Customized alert messages.
5. Minimum application size (2 MB).

The following are the limitations:

1. Localized only to a specific state.
2. Does not integrate with popular messenger services.

E. Go Suraksheit

This is one of the most recent application, launched on May 2016. The following are the advantages:

1. Sends SMS and has the capability to call the stored contacts.
2. Posts a customized alert on Facebook.
3. Sirens alarm in order to alert the people in vicinity to create awareness.
4. The user has to enter a configurable pin to stop the alarm. All of the above events occur when the user presses the help button in the application.
5. Does not consume much of the phone memory as the application size is only 2.56 MB.

The following are the limitations:

1. Lacks an appealing UI.
2. Does not integrate with popular messenger services like Whatsapp etc.

F. RideSafe

A very good personal safety application which provides safety during cab travels. it is a application which is launched recently, since March 2015.

The following are the advantages:

1. Uses an intelligent algorithm to track any deviations in the journey during cab travels.
2. Appealing UI.
3. SMS alerts at free of cost.
4. Alerts are automatic when any deviations is detected in the route during travel.
5. Minimal Application size of 2 MB.

The following are the limitations of the applications:

1. May not be able to alert and track if destination or a specific route is not specified as the trigger event is the deviation in the specified route.

2. Does not provide the feature of calling hotline or emergency numbers with one touch tap.

From the above existing systems the following limitations are observed :

1. In most applications, the alert message sent to the contacts cannot be customized.

2. Many applications lack an appealing UI.

3. Login and Sign up feature is not available. This feature enables the users to register. The location of these registered users can be tracked with the help of this feature.

4. Google and facebook login is available.

3. PROPOSED SYSTEM

The following are the components of the proposed system:

A. Mobile Application

This is the major component of the system. It helps in tracking the current location of the registered user.

It has the following features:

Login and Sign-up with field validation for invalid entry of data.

Customized alert messages - the user can either send the default message or he can customize it to his needs.

This is the only system which has the feature to send emergency messages to contacts on Phone messenger service.

Displays the current location of the user in the map. (Fig. 4) This feature is provided so that the victim can be aware of the location in case the current location (e.g. remote areas) is not known to her/him or in case she/he travels in a mode of transport which is completely enclosed.

All helpline numbers are displayed in the application with one touch calling feature. The user has to touch on the screen where the number is displayed to called those helpline numbers. (Fig. 5)

B) Website

The website of our android application (www.helpmeout.ga) in this all the details of our android application is given. From this the user can see that the user can see the emergency contact numbers. In this there login will be available where the user has to login and he/she can send the details of the very closest relatives.

From this website user can see the latest blogs or news about any emergency in various countries.

The web application displays the following fields of all the registered users on a successful login of the administrator:

- Name.
- Email.
- Phone Number

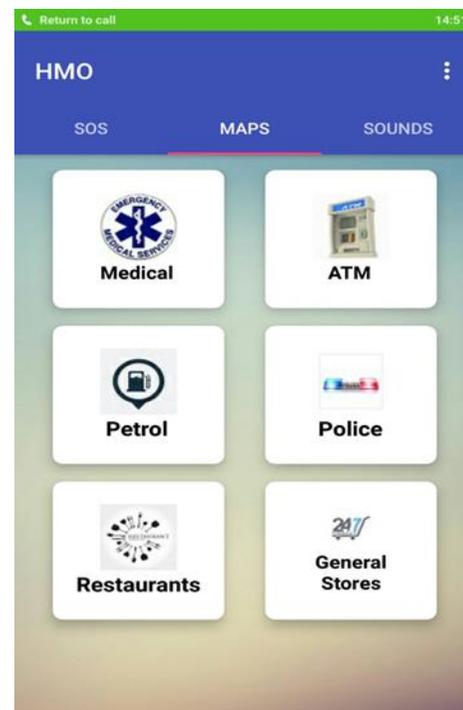


FIG –MAPS

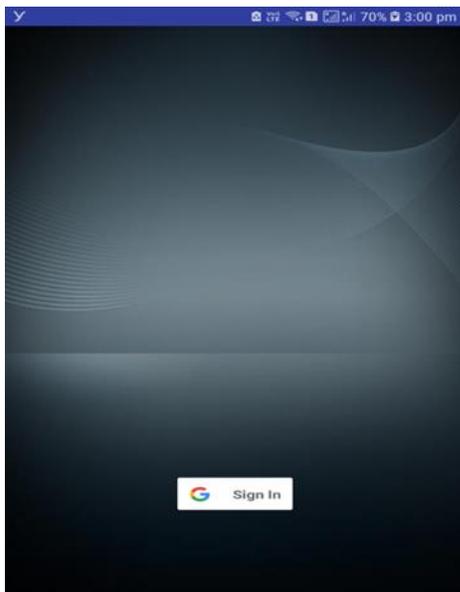


Fig – SOS SCREEN

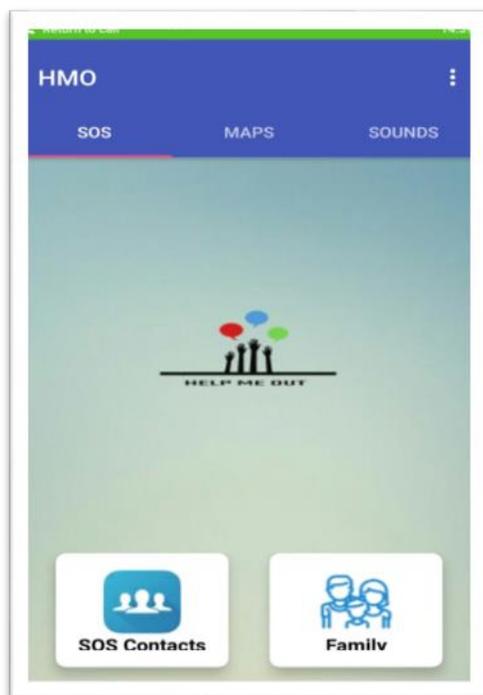


FIG- SOS CONTACTS

4. PROCESS

A. Process for Mobile application:

The overall process for the mobile application is as shown in Figs. The following are the major steps involved which is described briefly:

- 1) Logging into the application
- 2) Storing the contacts to whom the alert messages need to be sent.

Sending Alert messages by the application to the stored contacts and on message Location will also be sent.

The detailed explanation is as follows:

Login:

The user has to initially login as shown in Fig. 1a. If the phone number is valid, the user lands into the main activity page of the application. Otherwise the user has to Sign Up as the application automatically launches the Sign Up activity. After which the user can login using the registered phone number. In the login activity, the following fields undergo the following validation:

In the Sign Up activity, the following field undergo the following validations:

Email: Should be a valid Email ID including the “@” character and .com.

Storing Contacts:

The emergency contacts should be added manually by the user. The contacts can be added by the floating action button present at the bottom of the contacts tab in the application. When this button is pressed, the add contacts activity is launched. In the add contacts activity, the user has to add the name, mobile number, select between the default message or he can type his own message. Once all the details are typed the user has to press the save button. On pressing the save button, he is taken back to the contacts tab where the name, phone number and the message to be sent to that particular contact are displayed in the form of a list.

Trigger Event (shake):

The trigger event for sending the emergency alert messages is shaking the phone. In order for the emergency messages to be sent when the phone is shaken, the Anuti application has to be opened and the shake should be greater than threshold intensity which is already set in the application. Further, the shake is detected by the accelerometer, a hardware component which is commonly available in most of the smart phones these days. The variation in the acceleration (excluding the acceleration due to gravity) is compared with the threshold value. The threshold value was decided after several trial and error methods to make the application to be enough sensitive.

Sending alert messages & communication to a server:

Once the trigger event i.e. shake occurs, SMSs are sent to all the contacts stored in the application. Simultaneously an activity to select contacts on Whatsapp is launched. The user can select a single contact to post the emergency message or

the user can select a particular group in order to alert a wide number of audiences. The default alert message along with the location link sent on Whatsapp is as shown in the Fig. 3b. Simultaneously, the location link is also stored on a centralized database which is present on the parse server, the server being hosted on the internet.

5. CONCLUSION

Though there are existing systems which are also good personal safety applications, they either lack some or most of the features. These features include one touch on the helpline numbers to call, basic login and sign up facilities, displaying the accurate location of the user who has installed the application on the mobile device. This system is an improvement over the existing systems and also includes some exclusive .It also contains various sound alerts like police ,fire ,ambulance etc and also contain the location of the emergency services such as ATM, Police Station and Medical Stores etc.

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