GPS-based safety alert in Android

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Abstract
This application's suggested solution, Project Safety Alarm, uses GPS in Android to assist regular visitors at various locations in determining the specific position in which they are presently standing and also introduces the idea of recording current location data specifics. Every second, the location data is saved and kept in the database. This is so that the individual can be quickly located in the event that they go missing or are not discovered using the saved location data. We also offer emergency system alternatives here. Alarms are now configured for specific times. There are many circumstances where the alarm/reminder is based on your location rather than the time. The mobile application that is downloaded and installed on a mobile can give a alarm based on a particular location.

Keywords- Alarm, Global Positioning System, Android

Introduction

The operating system, middleware, and important apps that make up the Android software stack for mobile devices. In 2005, Google Inc. acquired Android Inc., the software's original creator.The Linux kernel serves as the foundation for the mobile OS used by Android. Android was created and released with assistance from Google and other Open Handset Alliance members.The upkeep and future development of Android are the responsibility of the Android Open Source Project (AOSP). The most popular platform for smartphones worldwide is Android.In all weather conditions, everywhere on or near the Earth where there is an unhindered line of sight to four or more GPS satellites, the Global Positioning System (GPS) gives location and time information in all weather, anywhere there is a clear line of sight to four or more GPS satellites and the Earth, or somewhere nearby.

Anyone with a GPS receiver can use it for free, and the US government is responsible for maintaining it.A network of 24

satellites sent into orbit by the U.S. Department of Defense make up the Global Positioning System (GPS), a satellite-based navigation system. Although the government made GPS available for civilian use in the 1980s, it was initially designed for military use. Everywhere in the world, 24 hours a day, GPS operates in any weather. The usage of GPS is free of setup or membership fees.

GIS enables us to find a ROUTE or branch close by. Any type of geographically referenced data can be collected, stored, processed, analyzed, managed, and presented using a geographic information system. Enter your postcode, town, or city in the locator to see all routes in your area, then click "Search" to get the services you need. GIS is the fusion of database technology, statistical analysis, and cartography. The phrase broadly refers to any information system that incorporates, saves, edits, analyzes, distributes, and displays geographic information to support decision-making.

GIS is a more sophisticated mapping technique that is linked to a specific database. It is a more inclusive phrase than the GPS in its technical sense because it is general. GIS makes it possible to locate a ROUTE or branch close to us. The goal of a geographic information system is to collect, modify, store, analyze, manage, and present all kinds of geographically referenced data. Enter your postcode, town, or city into the locator to find the services you need, then click "Search" to view all ROUTEs in your neighborhood. Cartography, statistical analysis, and database technology are all combined in GIS. In a broad sense, the term refers to any information system that incorporates, saves, edits, analyzes, communicates, and displays geographic information for decision-making. A specific database is linked to the more sophisticated mapping technology known as GIS. Its generic nature makes it a more inclusive phrase than the GPS in its technical sense.

System Model

A system architecture, sometimes known as a systems architecture, is a conceptual model that describes the composition, operation, and other aspects of a system. A system's formal description and representation—known as its architecture description—is set up in a way that facilitates analysis of its structures and actions. The user has various alternatives, as depicted in the picture. The alarm can be set, a location can be chosen, and the alarm may be activated and deactivated.Additionally, users can edit previously saved alarms

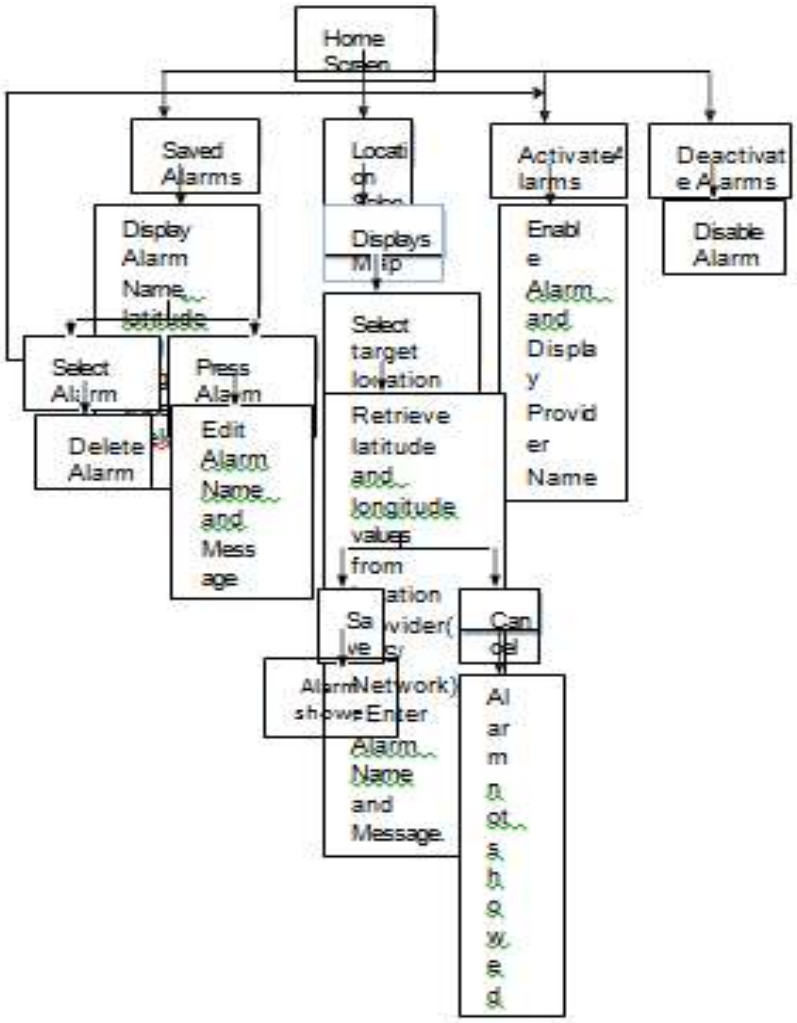

FIG: SYSTEM ARCHITECTURE

THE PROJECT REQUIREMENTS

Hardware Requirements

CPU type : Intel Pentium 4
Clock speed : 3.0 GHz
Ram size : 512 MB
Hard disk capacity : 40 GB
Monitor type : 15 Inch color monitor
Keyboard type : internet keyboard
Mobile : ANDROID MOBILE

Software Requirements
Operating System : Android
Language : ANDROID SDK 2.3
Documentation : Ms-Office

Operating Systems
Windows XP (32-bit)
Windows 7 (32- or 64-bit)
Windows 10(32- or 64-bit)

Selection of Appropriate Technology
The system employed Eclipse, Sun JDK, Android Google API, and the Android Development Tool plugin to create the application. For the development of applications for Android users, Android platforms offer a top-notch environment. Furthermore, it provides resources for building applications that are visually appealing and make use of each device's hardware capabilities.

Linux-based Android [4] is an operating system particularly developed for touch-screen mobile devices like smartphones.

For free, the Android SDK is accessible on Windows, Linux, and Mac OS X. Despite the removal of the original Java SE packages, developers can still use well-known Java development tools. In their stead, GUI packages that are better suited for the condensed screen sizes utilized by mobile devices have taken over.

Ant and Eclipse. Existing Java SE-based code can be rather easily migrated to Android as long as it doesn't interact with any of the packages that were deleted. The Android operating system has recently gained a lot of traction, therefore this application will be used by many people who commute by car. Most users may easily utilize it for the first time thanks to its straightforward and intuitive user interface design. Users have the option to place an alert call whenever and wherever they need or desire to do so thanks to the unique unit's integration of GSM mobile and satellite-based GPS.

The following are some benefits of using Android[6]:

Android phones have the ability to run multiple applications simultaneously, allowing users to browse Facebook while listening to music.

A notification will constantly appear on the home screen of an Android phone for any missed calls, emails, or SMSs, making it impossible for the user to miss any of these notifications.

Simple access to tens of thousands of apps via the Google Android App Market: On Android smartphones, many of apps and games are available for download.
Install a customized ROM: Android mobile phones support a variety of custom ROMs.

Widget: The user can quickly and easily access a number of settings with the widgets on the home screen.

Google Maniac: The Android operating system has been connected with Google services, allowing users to rapidly check their email on Gmail.

There are numerous ways to save user and application data with SQLite Android. One method of storing user data is SQLite. The Android OS includes an extremely lightweight database called SQLite. Where source compatibility is not a concern, the android.database and android.database.sqlite packages provide a higher-performance option.

XML

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For instance, XML layouts can be developed for various screen orientations, device screen sizes, and linguistic variations. Furthermore, specifying the layout in XML makes it simpler to visualize the UI's structure, which facilitates problem-solving [8] [9].

GPS

The Global Positioning System (GPS) [5] is a medium earth orbit (MEO)-based satellite-based navigation system. To give its users information about location, speed, and direction, GPS depends on a constellation of at least 24 satellites. In order to pinpoint the precise location, a process known as trilateration is used in conjunction with atomic clocks in the satellites.GPS determines the user's location by comparing the times it takes for signals from various satellites to reach the receiver. The smart phone must include an internal GPS receiver since GPS signals must be deciphered.

GPS has a relatively high precision compared to most other methods, but because it needs a clear line of sight to the satellites, its use inside is severely constrained. The restricted number of satellites that GPS can view makes it exceedingly inaccurate in large cities with many tall buildings and winding streets. The Android emulator enables the installation of a file containing previously recorded track points so that it may simulate a real GPS and trick programs into thinking that the device is actually moving. This method was used to upload a real GPS-recorded track to the emulator. One must first identify a good strategy to define this area before being able to determine if a user is inside or outside it. A GPS defines an area as a circle with a radius of r and a center coordinate of (xc; yc).

A drawback of GPS is that if a user tries to designate the center of a circular area in the middle of the user area, they would probably fail.

Implementation

The three modules that make up the system are discussed in the following sections:

Set Alarm: This module is in charge of receiving user input regarding the alarm, including the location's name, the alarm's expiration date, and, if applicable, a description of the reminder. The task of transforming the place name into precise geocoordinates and setting an alarm for that location falls on this module.

Alarm Generator: If the user is close to the area where the alarm is set, this module is in charge of sounding the alert.

Alarm Viewer: This module is in charge of showing the alarms that have already been set. permits user to modify, delete, or update alarms.

Selection and Characterization of Locations

Users must setup the application using a variety of choices in this module when using it for the first time. Users are provided options to customize the mobile application, including options for emergency numbers with two choices, the name that should be displayed in messages, the location information, time information, pin information, etc. The application is secured with pin information. In order to assist in an emergency, no one should be able to alter the configuration files. The configuration files could potentially be altered, hence secure pin approach is used to guard against these threats. Crisis Situations Users who have been informed of an emergency are unlikely to continue their usual usage patterns.

Particularly shortly after learning of such problems, users are probably going to try to contact their friends and/or relatives. Here, we took into account dire situations including accidents, heart attacks, getting lost, and being attacked by thieves. Any emergency contact information, such as a friend or relative's phone number, that was initially configured in the first module will immediately receive an alert message.

Experimental Results

The findings of the experiment are shown in the figures below:

In accordance with Fig. 6.1, the user can specify the recipient's name and phone number.

Additionally, there is a pin that will be useful for security reasons.

Fig 4.1 : Home Screen

Fig 6.2 shows a button to be clicked. By that message will be send to the given contact number.

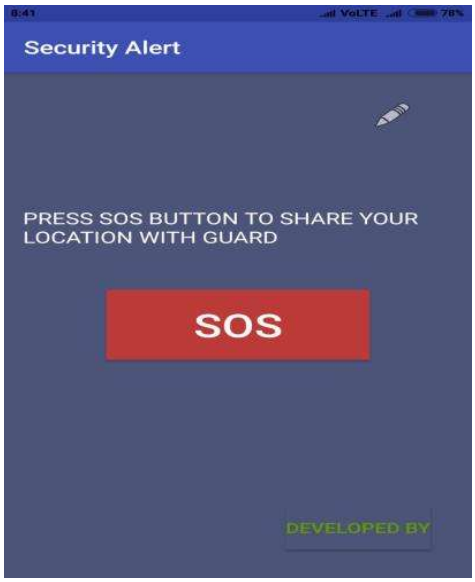

Fig 6.2 : Button To Share Location

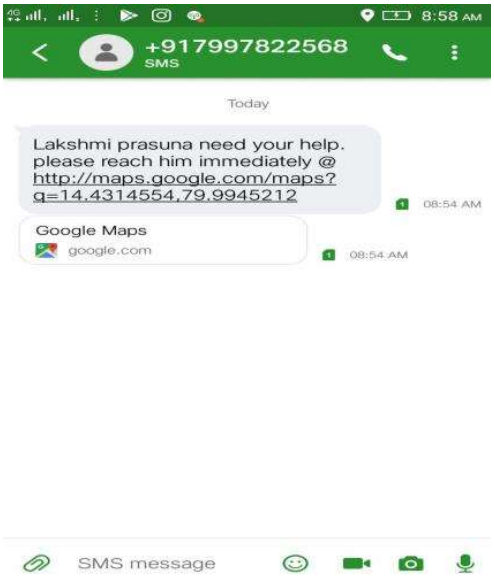

Fig 6.3 : Notification Message

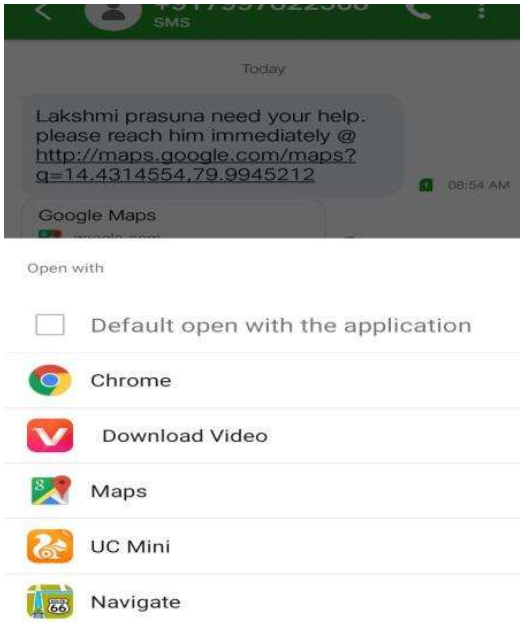

Fig 6.4 : Selection of Appropriate Application

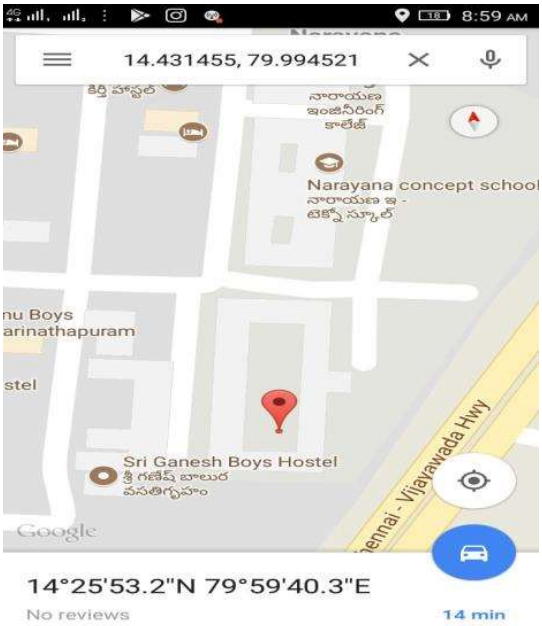

FIG 6.5 : GOOGLE MAPS

Conclusion and Future Scope

With the help of this project, users can send alert messages to specified contact numbers. By using the geological coordinates, the contact person can determine the user's current location.Future plans for this program include the addition of alarms on the user's end in addition to notification messages.

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