

Anti Theft Mobile Application with GPS Tracking

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Abstract: Lots of Applications are developed to track a Smart phone but still it is a major concern. User has to manually report to the customer care to block the number of the lost Phone. So that, Android Application is deployed with initial registration of Alternative Mobile number. An Application which is deployed in the mobile devices can be able to Track the current location of the device. If the robber changes the SIM card, immediately then location details are sent to the alternative Phone number of the original User. In this paper, both the logic of tracking the Theft Phone with mobile number & with GPS is tracked continuously. The registered alternate mobile numbers can get the SMS alert from the Theft Mobile. This process is reworked continuously to track the android mobile phone. Our Anti-theft mobile application will be capturing the picture of the thief as soon as the mobile is switched on and app launched and will be sending the location to the alternate mobile number. The location will be sent as a link of the map on which the location traced with longitude and latitude which can view in maps with marker to location. It will be needed an active internet connection to make the process possible, the user can register for it's lost phone on our web application through which the mobile application will be triggered. Once the application is triggered with lost status, it will start working and as soon as the app launched, it will click a picture of the thief and will send it along with the location to the alternate mobile number mentioned during the registration process. This will help the user to trace his/her mobile phone without third party help.

Keywords: Location tracking, Android, Smart Phone, Context, Web Application, SMS Services, Picture Capturing

INTRODUCTION

According to data compiled by the Delhi Police, as many as 8,728 mobile phones were reported stolen or missing between January 1 and October 31 in 2010. This year, till date, the Delhi Police were intimated about the theft of 10,066 mobile phones and only 2% of the stolen phones are recovered and hence it creates a big worry for the users to safe guard their cell.

Availability of many devices such as smartphones, tablets, laptops, net books, wristwatches, TVs, etc. that can utilize various sensors like accelerators, temperatures, temperatures gauges, GPS receivers, gyroscopes etc. and the availability of wireless Internet have made localization various sensors like accelerometers, temperature gauges, GPS (Global Positioning Services) receivers, gyroscopes, etc. and the availability of wireless Internet have made localization easier and more effective. Since smart handhelds have a variety of sensors like accelerometer, compass, gyroscopes etc., it is possible to make tracking systems not only location aware, but also context aware. Location is a part of context but the context also encompasses conditions like, if the user is moving, if he is taking turns etc. Gathering context helps to better track an individual especially for surveillance.

If the device is stolen, it would be easy to predict the exact location of the device at some future time instant if the context (including location) of the device is known at the current time instant. And we can also extend it to the higher level where we can fetch the address, country and state of the theft where he/she located and last on-line update of phone.

In this research paper, we aim to propose a antitheft mobile application which takes both location of the device as well as the camera triggering into account, through which locating the stolen or lost device would be easy track and it will helpful to see the theft picture that would be definitely help out to authorities as well as to user to catch thief

1.1 DEVICES THAT CAN BE TRACKED

Android Based: The devices that will be located through the application will be android based operating systems, as the mobile application is android functional, though we aim to get along with other operating systems as well after this.

Network Based: The devices should have an active internet connection and it is needed to be switched on and get the application working.

Working Camera: The camera of the mobile phone must be working, as when the web application will triggered with lost status the mobile application and camera will be opened and it will be it will click a picture most probably of the thief or the person holding it and the picture will be uploaded in the database and hence it can be accessed or sent to the web application from there.

Consequently, in this paper, a service for context tracking of Smart handheld devices is proposed that takes into account both location of the device and user context for better surveillance. This technique can be applied for tracking location of individuals, lost or stolen devices etc. in a user friendly manner that saves considerable time.

RELATED WORK

In this paper, it analyze shortcomings of the basic system, and develop and evaluate solutions to address these shortcomings. Additionally, describe several new enhancements, including a novel access point-based environmental profiling scheme and a viter bi-like algorithm for continuous user tracking and disambiguation of candidate user locations.

The frequently proposed solution to protect location privacy suggests that mobile phone changes coordinated with different location changes. In this paper, we analyze the non-cooperative behavior of mobile location with a simple model, where each player aims at maximizing its location privacy at a minimum cost.

The motivation for every location basis information system is: “to assist with the exact information, at right place in real time with personalized setup and location sensitiveness”. In this era we are dealing with palmtops and i-phones, which are going to replace the bulky desktops even for computational purposes. Vast number of applications and usage where a person sitting in a roadside café needs to get relevant data and information. Such needs can only be catered with the help of location basis services.

Typical location determination systems require the presence of a physical device that is attached to the person that is being tracked. In addition, they usually require the tracked device to participate actively in the localization process. In this paper, the concept of web application with picture capturing has been introduced. This system is envisioned to be able to detect, track and identify entities that carry device, nor participate actively in the localization process because system work by monitoring and processing changes in the received location signals at one or more places to detect changes in the environment.

The proliferation of lightweight, portable computing devices and high-speed wireless local-area networks has enabled users to remain connected while moving inside a building. This emerging paradigm has spurred a lot of interest in applications and services that are a function of the mobile user’s physical location. The goal here is to enable the user to interact effectively with his or her physical surroundings. Examples of such interactions include: printing a document on the closest printer, locating a mobile user, displaying a map of the immediate surroundings and guiding a user inside a building.

PROPOSED SYSTEM

This paper presents a technique to improve anti-theft for android based mobile phones by using different services like SMS, Camera. Android based Application is installed in user mobile which is used to track the IMEI. If Android Phone is stolen and on at later time it will Track the location. If the status is lost, application triggered and GPS is initiated automatically and exact location of the thief has been captured and store to database with the location Geo-coordinates..

SOME BENEFITS ARE:

- Easily identify the theft mobile.
- Less time-consuming process.

- Automatic Process.
- Get thief picture into web application.

MODULES

Mobile Client
Server
Web Application
Google Maps and SMS Alert
Tracking GPS Location

4.1 MOBILE CLIENT

Mobile Client is an Android application which is created and installed in the User's Android Mobile Phone and will be connected to the database. Registration for the application will also be done from the mobile application. The Application's First Page Consist of the User registration Process and login process. The user login page is creating with the help of text field & button in the android mobile. While creating the Android Application, we have to design the page by dragging the tools like Button, Text field, and Radio Button. It gets completed designing, by writing code for each. After creating the full mobile application, it will generated as Android Platform Kit (APK) file. This APK file will be installed in the User's Mobile Phone an Application. Using this APK user will be registering with the server by providing Alternative mobile number & Email ID, phone number, IMEI number. User's IMEI number should also filled.

4.2 SERVER

The Server Application which is used to communicate with the Mobile Clients. The Server can communicate with their Mobile Client by stored data and status data. User will be initially registering with the server. Server will track the user with user's with status and GPS.

4.3 WEB APPLICATION

Web application helps the user to see details of the data which was stored when phone on and location fetched if any. It is easily available to users to see picture of user and get latitude and longitude of thief last on of phone.

4.4 GOOGLE MAPS

In the section if the mobile is stolen then the location of the anonymous person is traced by the GPS application in the mobile so that it will update every movement of thief location and send the location value to the alternate mobile number and store latitude and longitude values in database which help the real user to see the location on maps mobile. SMS alert the GPS location of the thief is sent to the owner so that they can easily trace the location of the anonymous person by clicking the link of the location URL which was send as SMS Alert.

OVERALL ARCHITECTURE

System architecture is a conceptual design. That defines the structure and behavior of a system. An architecture description is a formal description of a system; organize in a way that supports reasoning about the structural properties of a system. It defines the system components or building blocks and provided a plan from which products can be produced and system developed, that will work together to implement the overall in a way that supports reasoning about the structural properties of the system.

REPRESENTS

1. Mobile Stolen by Attacker/thief
2. Update status to Lost phone
3. Application triggering started
4. Location fetching
5. Picture Capturing
6. Store to server and database
7. SMS to alternate mobile number

5.1 Elaboration

It has been divided into 3 major layers:

- Application



- Middle Layer
- Data Services

APPLICATION LAYER

This is representing the specific application such as a “T.R.O.V.A (Anti-theft)” application. This consists of various activities and services which is using and make possible to track mobile phone. It consists of location services, SMS services and database services.

MIDDLE LAYER

This wraps access to Core Location based services Features (Location Tracking, GIS Provider and Location Collection Services) to provide consistent interface to Location Based Services applications.

LOCATION TRACKING

This component stores the location trace of individual users. This represents a fundamental component in next generation Location Based Service as it contains the data that allows a user’s route to be determined and potentially predicted. In particular, this component would typically support the following functionality:

1. Trace the location of phone for last updated location.
2. We will access the location through Google Maps.
3. Keep records of user’s and location data to database.
4. Able to get and view picture of thief via application
5. Get SMS of location on alternate mobile number.

GOOGLE MAPS

This component provides geospatial functionality for many Location based service including map information, map visualization and directory services. Google Maps with its API can be considered for viewing location.

LOCATION COLLECTION SERVICE

This component performs location collection to get a latitude and longitude for that phone where it last on directly (e.g., via GPS receiver in the Smartphone) [7].

Android provides access to the above components to facilitate the implementation of Location based services through the help of following classes;

- Location Manager
- Location Provider
- Geocoding
- Google-Map

LOCATION MANAGER

Location Manager Class of android is present to manage all other components needed to establish a system [9].

LOCATION PROVIDER

Location provider represents the technology to determine the physical location. GPS provider and Network provider can be accessed directly by using the static variables defined in the Location Manager class.

LocationManager.GPS_PROVIDER LocationManager.NETWORK_PROVIDER

It would return the geocoding of the location in form of latitude and longitude. We can get the location which is last updated and with the help of Google Maps we can open that location and view in it.

GEOCODING

Reverse geocoding provides a way to convert geographical coordinates (longitude, latitude) into street address and forward geocoding provides a mean to get geographical coordinated from street address. For forward geocoding we use `getLatitude()` and `getLongitude()` method as shown in the following code Block

```
double latitude = location.getLatitude(); double longitude = location.getLongitude();
```

GOOGLE MAP IN ANDROID

Android provides a number of objects to handle maps in Location Based Services system like Mapview which displays the map. To handle this location into map, click with URL and it will take you to in built Google maps and locate with

zoom the map, localize the map by means of Map Controller.

SMS IN ANDROID

Sms is a feature of android application to send or receive message about anything to anyone. SMS helps us to get the message of thief location so that it will trackable. SMS service initiated as soon as it get location and send URL which contains latitude and longitude and some message,

SMS service can start with some lines of code which provides us the facility to send sms and receive to the number.

```
SmsManager smsManager = SmsManager.getDefault();  
String msg = " Location is: http://maps.google.com/?q="+ latitude_value +","+longitude_value;  
smsManager.sendTextMessage(phoneNo, null, msg, null, null);  
Toast.makeText(this, "SMS Sent", Toast.LENGTH_LONG).show();
```

GPS IN ANDROID

Android is an Open-Source and Linux based mobile operating system. Android was developed by the Open Handset Alliance, led by Google. Android offers many different features for users and GPS is one of them. Android provides many SDK's to build more efficient and Scalable applications which help users.

- Built in GPS receiver.
- Get location updates with allow from GPS.
- System responsible for location updates.
- Require few lines of codes.

Android Advantages

- Available to mostly users
- Provide better features and application support
- Open Source and easily accessible
- Modern world need and use
- Provide better facility to build application.

Android Disadvantages

- Can't access some application to android.
- Some limitations exist in blue tooth
- Sometime not operate correctly.

IMPLEMENTATION AND RESULT

Application development includes implementation of application features , build essential work related features and use the required technologies with efficiently.

SYSTEM REQUIREMENTS

It is required the Android application and Web application to use this for fetch location of lost phone. Android application named "T.R.O.V.A (Anti-theft)" should installed in user's phone and must have logged after registration. This will help user to track phone if lost in future. Secondly, web application is required if phone lost and then user can track and see details of thief and location

APPLICATION FEATURES

Application starts and stays to Welcome activity where message shown. If lost and status updated then, when again application starts it will take open camera and capture photo of person who is holding that phone or probably of thief. After capturing, on button click it will store location and picture successfully with automated process and also send message to alternate number which used at time of registration.

Phone fetches status from database to trigger for location fetching. As soon as status updates it will launch and get location and upload it to database and user can get location individually or with the help of police. After uploading. It also sent an URL of map with latitude and longitude of geo-co-ordinates to track it in map. And when phone found, user can update status and that lost status will delete from database and new entry will store again if lost by any-how.

TECHNOLOGIES

The Android application "T.R.O.V.A (Anti-theft)" is programmed in Java Language using the Android Studio System

Software. We have used the Software Development Kit to implement our logic into a full fledged application.

For web application, we used HTML (Hyper Text Markup Language), CSS (Cascading Styles Sheets), Bootstrap 5, PHP and implemented both Front-end and Back-end.

Some of the development environment's used are Netbeans for Web application, Android Studio, Google chrome is used for displaying the contents

DATABASE

We have used PhpMyAdmin for our database because it provides us SQL features and storage availability. We have built database using SQL command and table also. We are storing data of users, location, contact, sms alert.

DATA FLOW DIAGRAM

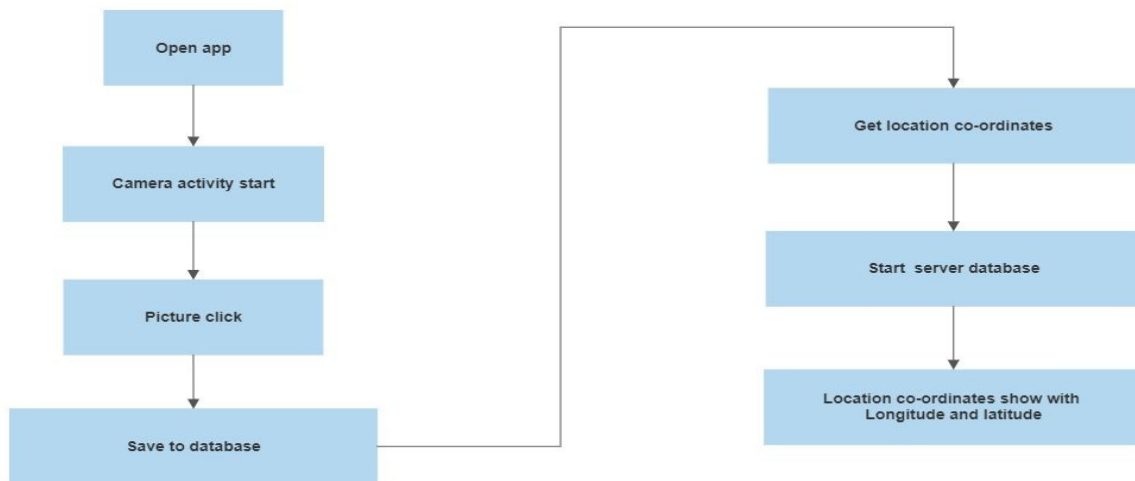


Fig.1: Data-Flow diagram for GPS tracking and storing.

➤ SNAPSHOTS

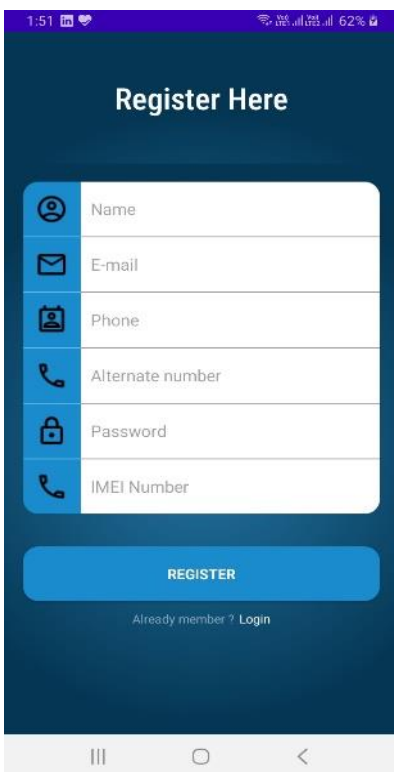


Fig. 2: Login Activity

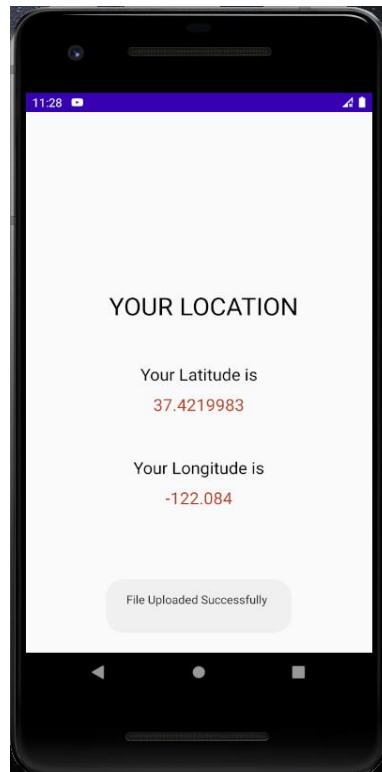


Fig.3: Image Uploaded

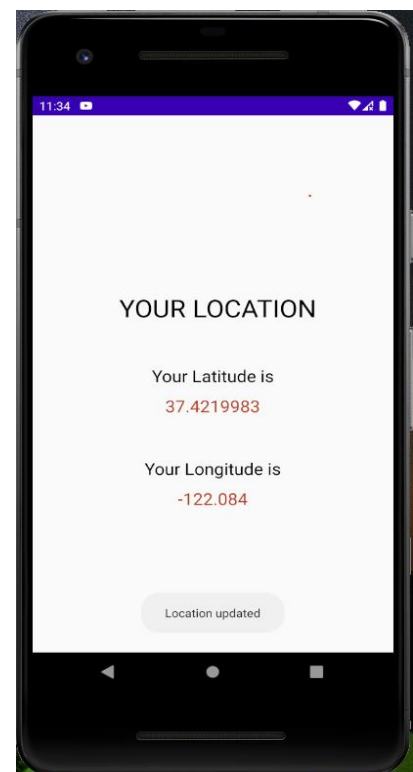


Fig.4: Location Updated

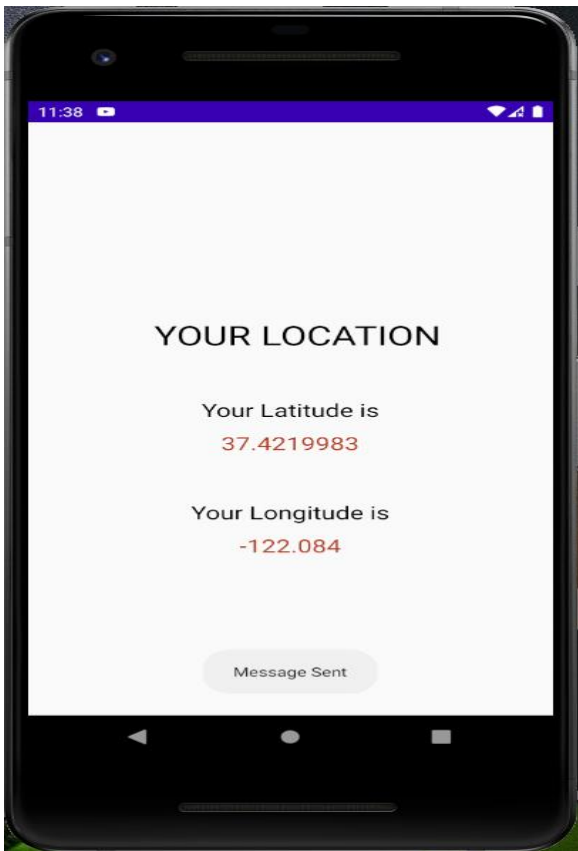


Fig.5:Message Sent

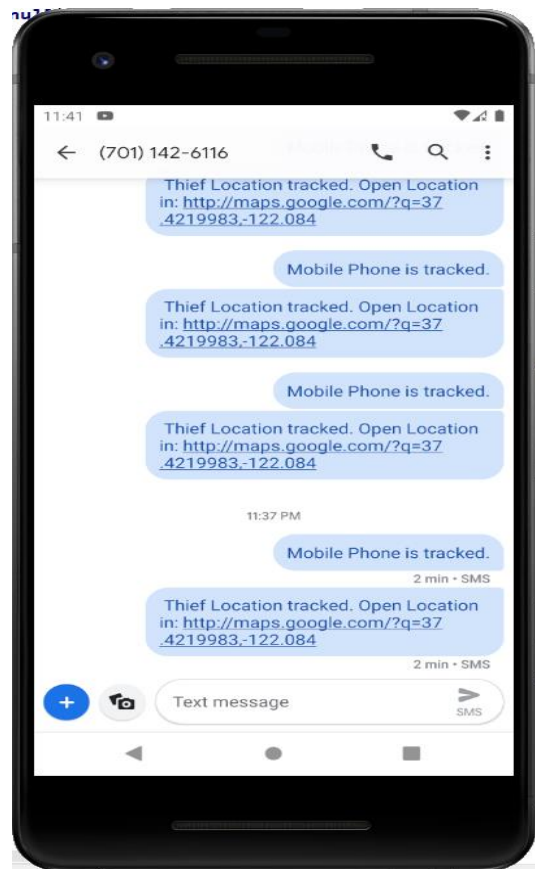


Fig.6: Message Received

CONCLUSION

This paper presents an application for android based mobile phones. This application deploys a security solution, which uses in-built functions of the mobile phone in accordance with the mobile application and helps the user to track his mobile phone. The android application uses the camera as well as location in the background, which will then send the coordinates of the location to an alternative mobile number registered as well as the user portal which can be accessed on the web application using the login credentials. The mobile application can be triggered using the web application by clicking on the lost phone button.

This application is currently for android based mobile phones but as technology evolving day by day, the application will also be made for other OS as well. Future scope of our application is to make it available for other as platforms as well and currently it uses an active internet connection for all the steps, we will look forward to make it more convenient.

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