

CHAPTER 1

INRODUCTION

1.1 Overview:

With the advancement of information technology people want to access data anywhere and anytime. Mobile communication has gradually taken over the world, changing trends from simple voice communication and text messages to complex data communication and mobile internet business. But in the technology oriented world, crime is also increasing at a very fast pace so, there is a need of security to be analyzed frequently. Phone has become a necessity but as it is said with benefits comes flaws. Being a portable device, crime can be easily committed through user intentionally or unintentionally.

As Smartphone's are becoming more powerful in terms of communication and computation capabilities, they can be used for illegal purposes. One such example of this is when people click photographs of classified documents surreptitiously or engage in photography at places and monuments where it is prohibited. To alleviate this problem, we propose a Location Based Services (LBS) android application that disables the camera automatically at the specified location.

One of the powerful features offered by android is LBS which have attracted tremendous interest in recent years. LBS are group of applications that utilize the geographical location of the device to give services constructed on such information. It offers two-party system of communication between the services provider and the user. Based on the user requirements the service provider to supply information customized to the needs of the user. Therefore, Global Positioning System (GPS) plays an important role in finding the location of the user. It is worldwide satellite navigational system formed with 24 earth orbiting satellites forming a constellation.

These satellites make two complete revolutions in every 24 hours. The navigational messages are continuously broadcasted by the GPS. With the use of four additional satellites the GPS receivers calculate the location. We combined this feature with the Device policy manager to have the services that we required i.e. camera disable. Device policy manager is a unique class that enables the application to implement some special policies on the Smartphone.

Some of these policies are setting a password for the device, erasing the user data in case of failed attempts of passwords and being a powerful class, it can also disable the camera.

The application has two modules the admin module and the user module. The admin module has complete control over the application. It can enable as well as disable the camera and prevent the user from uninstalling the application. The user module allows the user to enter the location where the camera is to be disabled. As soon as the user reaches that location, the camera cannot be accessed. Though, the app will automatically enable the camera once the user moves 0.5kms far from the saved location.

The rest of the paper is organized as follows. In the second part of the paper, LBS using the GPS is introduced. Further, the third section depicts the work done, primarily about the complete design and implementation of a location based application that disables the camera on android system. In part four features of each module are elaborated. Part five shows the results and the last part is the conclusion and future scope.

1.2 Advantages:

1. This application is developed for the security of certain organizations in which Leakage of any information is dangerous.
2. It offers many advantages to the mobile user to retrieve the information about their current location and to get useful information near their location.
3. The application uses GPS, LBS that allow the user to save the office location and on reaching the saved location, the camera will be disabled.

1.3 Disadvantages:

1. There is a provision to change the password of the admin.
2. Can bypass the security or can enable the camera till the time they at the certain location.
3. GPS uses a lot of battery.

CHAPTER 2

LITEATURE SURVEY

2.1 Location Based Services using Android

AUTHOR: Sandeep Kumar, Mohammed Abdul Qadeer, Archana Gupta

Initially mobile phones were developed only for voice communication but now days the scenario has changed, voice communication is just one aspect of a mobile phone. There are other aspects which are major focus of interest. Two such major factors are web browser and GPS services. Both of these functionalities are already implemented but are only in the hands of manufacturers not in the hands of users because of proprietary issues, the system does not allow the user to access the mobile hardware directly. But now, after the release of android based open source mobile phone a user can access the hardware directly and design customized native applications to develop Web and GPS enabled services and can program the other hardware components like camera etc. In this paper we will discuss the facilities available in android platform for implementing LBS services (geo- services). With the development of the information era, people hope to access data anywhere and anytime. To meet this requirement, mobile computing is researched as the combination of computing and mobile communication technology.

2.2 A Survey on Android Security, Vulnerabilities, Attacks and Defense

AUTHOR: J Rahul, Anirudh R Bharadwaj and Ramakrishna KT

Smartphones have become pervasive due to the availability of office applications, Internet, games, vehicle guidance using location-based services apart from conventional services such as voice calls, SMS's, and multimedia services. In this survey, we discuss the Android security enforcement mechanisms, threats to the existing security enforcements and related issues, malware growth timeline between 2010 and 2014, and stealth techniques employed by the malware authors, in addition to the existing detection methods. This review gives an insight into the strengths and shortcomings of the known research methodologies and provides a platform, to the researchers and practitioners, toward proposing the next- generation Android security, analysis, and malware detection techniques.

2.3 Implementation of location based services in android using gps and web services.

AUTHOR: Manav Singha, Anupam Shukla

Location based Services offer many advantages to the mobile users to retrieve the information about their current location and process that data to get more useful information near to their location. In this paper, we propose the implementation of Location based services through Google Web Services and Walk Score Transit APIs on Android Phones to give multiple services to the user based on their location. Location-based services (LBS) provide the mobile clients personalized services according to their current location. They also open a new area for developers, cellular service network operators, and service providers to develop and provide value-added services: advising clients of current traffic conditions, providing routing information, helping the users to find nearby shopping malls. Location-based services offer many merits to the mobile clients.

2.4 Location-based augmented reality with pervasive smartphone sensors.

AUTHOR: Ryan Shea, Andy Sun

Combining powerful sensors and near ubiquitous distribution, the smartphone has become an irreplaceable part of modern day life. Using the popular augmented reality (AR) smartphone app. Pokemon Go as a case study, we explore the world of pervasive sensing. In this paper, we show both the current state of the art that enable applications such as Pokemon Go to thrive, as well as the limitations and opportunities inherent in current pervasive sensing applications. A new phenomenon is being noticed in public places around the world. The sight of someone following step- by-step directions to their destination, checking restaurant reviews, or posting live videos of them themselves to social media has become a nearly universal experience. All of these things were a near impossibility for the average person without expensive and specialized equipment less than a decade ago, but are now as simple as downloading an app. The meteoric rise of this once luxury device to a ubiquitous computing and communication platform has been astounding and has opened up a plethora of new applications and services.

2.5 Survey on techniques for cross platform mobile application development

AUTHOR: Apurva P. Pawar, Vandana S. Jagtap, Mamta S. Bhamare

Smart phone is used by most of the population. Over thousands of applications are used daily and a new application gets launched as per need. From developer point of view for application to reach to most of the end users it need to run on max platforms, this needs redevelopment of application, we can solve this problem to some extent by developing cross platform application without additional investment .Now Mobile communication is being used by nearly half of the people all over world. According to IDC which is Worldwide Quarterly mobile Phone Tracker, Android has captured top position in market shares followed by ios at second and Windows Phone third; and also they are going to be major mobile Operating System players up to 2017 .This, paper will be more focused on technologies applicable to them.

2.6 An Implementation of user speech recognition and voice command based reminder service integrated with location based reminder using GPS technology

AUTHOR: Parth Doshi, Kaustubh Sakhare, Priya Pandey, Punit Dholu, Prof. Rohini Agawane

Only time and date based reminder application are available in the market for mobile phones. A manual entry has to be made by the user for setting up a reminder. A text popup and sound frequency alarm will be generated when the device time and date match with the date and date set by the user for any reminder. Sometimes the user is aware about the location where he wants the reminder rather than the time and date. But while setting up many reminders the user will not be aware about the time and date, but he will be aware about the location where he wants the reminder. Some reminders are location personified rather than a particular date or time. In this project we have designed an application which will enable the user to set location based reminder with the ease of voice commands.

The main purpose of voice and location based services is to provide users the comfort of easy assigning and retrieval of user required reminders. The ease of reminder retrieval through the use of Global Positioning System (GPS) based on users location and also through current date and time.

CHAPTER 3

METHODOLOGY AND IMPLEMENTATION

3.1 ANDROID AND ITS POWERFUL FEATURES

Android is the first open source mobile application platform that has the potential to make significant inroads in many markets. Android has powerful APIs, excellent documentation, a thriving developer community, and no development or distribution costs. As mobile devices continue to increase in popularity, this is an exciting opportunity to create innovative mobile phone applications no matter what your development background. Windows mobile and apple's iPhone now provide a richer, simplified development environment for mobile applications. However, unlike Android, they're built on proprietary operating systems that often prioritize native applications over those created by third parties and restrict communication among applications and native phone data. Android offers new possibilities for mobile applications by offering an open development environment built on an open source Linux kernel. Hardware access is available to all applications through a series of API libraries, and application interaction, while carefully controlled, is fully supported. In Android, all applications have equal standing. Third-party and native Android applications are written using the same APIs and are executed on the same run time. Users can remove and replace any native application with a third-party developer alternative; even the dialer and home screens can be replaced.

The overwhelming majority of cell phones on the market are the "consumer flip phones" and "feature phones". These are the phones consumers get when they walk into the retailer and ask what can be had for "free", or the "I just want a phone" customer. This customer's primary interest is in a phone for voice communications and perhaps an address book and maybe even a camera. Many of these phones have more capabilities such as mobile web browsing, but due to a relatively limited user experience, these features are not employed heavily. The one exception to that is text messaging which is a dominant application, no matter what the classification of device. Another increasingly in-demand category is location based services.

One of the big functionality gaps on these lower-end phones is the web experience. Part of this is due to screen size, but equally challenging is the browser technology itself which often struggles to match the rich web experience of the desktop computer. Android features the market-leading Web Kit browser engine, which brings desktop compatible browsing to the mobile arena. Following figure demonstrates the Web Kit in action on Android. If this can be effectively scaled down to the feature phones, it would go a long way towards penetrating this end of the market.



Figure 3.1: Inbuilt Web Kit in Android

3.1.1 Google Maps and Geocoding Support

Android lets you create activities that include interactive Google Maps as part of your user interface with full access to maps that you can control programmatically and annotate using Android's rich graphics library. Android's location based services manage technologies like GPS and Google's GSM cell-based location technology to determine the device's current position. These services enforce an abstraction from specific location-detecting technology and let you specify minimum requirements (e.g., accuracy or cost) rather than choosing a particular technology. To combine maps with locations, Android includes an API for forward and reverse geocoding that lets you find map coordinates for an address, and the address of a map position.

3.2 APPLICATION FRAMEWORK

Android framework contributes to the runtime environment in which Android application can be executed and managed that is a middleware. The fundamental function of application framework is to give level one foundation to applications as different Android classes. Components of this layer are mostly executed as services/daemons that run in the background. Some of major parts are portrayed below.



Figure 3.2: Android Support Satellite and Map View

An application framework is a software library that provides a fundamental structure to support the development of applications for a specific environment. An application framework acts as the skeletal support to build an application. The intention of designing application frameworks is to lessen the general issues faced during the development of applications.

3.2.1 .Components of Android Framework

Activity manager is a daemon that monitors active applications. It is in charge of overseeing services like terminating a process if the device is running out of memory. Similarly, content provider is one of the major component that is used to share data between various applications, e.g. the contact list information can be utilized by different applications. Therefore, it should be stored in a content provider. Intent is a request from an application for performing a certain action, while Google defines intent as follows. "Intent is an abstract description of an operation to be performed. It can be used to launch an activity and to send it to any interested receiver components, and to start a service or bind any service to communicate with a background service. Intents provide a facility for performing late runtime bindings between the components of different applications. It's most significant use is in the launching of activities and interactivities communication, where it can be thought of as the glue between activities.

3.2 Design of location based camera disable application:

To design the application to disable the camera we need to integrate android device administration API. Android provides this API to access the device administration features at the system level. This API helps to build many applications that are useful in enterprise settings. Administration can wipe data, enforce password policies, security policies, disable camera, etc. In this application, we will use the device policy manager mainly to disable the camera.

To access all the feature of device policy manager, this setting must register with the system by the user. If user doesn't approve the device policy manger then it will be present but won't be active. To use the android device administration API, special approval must be included in the manifest file of the application. The manifest must include:

1. Security policies need to be included or declared in the metadata.
2. A subclass of DeviceAdminReceiver [9] should be included. It binds device admin permission and has the ability to reply to the actions that are enabled by device admin intent.

In this application, we mainly use the classes `DeviceAdminReceiver` and `DevicePolicyManager`. `DeviceAdminReceiver` is used to implement the administrative components. This class conveniently interprets raw information and then sends it to the system. It may contain many call-backs that are triggered according to events. `DevicePolicyManager` class is used to manage policies enforced on a device. This class is used to disable the camera. The camera isn't permanently disabled but it can be enable or disable dynamically based on many properties like time, context, etc. the function `setCameraDisabled()` is used to control the setting. Once the application is installed and started, the splash screen will appear which will then load the login page for the user. One can enter the admin module or user module according to the requirement. For new users, a registration page will be opened and all the registration details will also be stored in the database. After that the user can enter the work place location or any location or pick the location using the GPS or network of the phone where camera is meant to be disabled.

User enters longitude and latitude which is converted to the location of the user with the help of Geocoder. However, after entering the location the application automatically checks whether user is within 0.5 kms of the radius of the entered location.

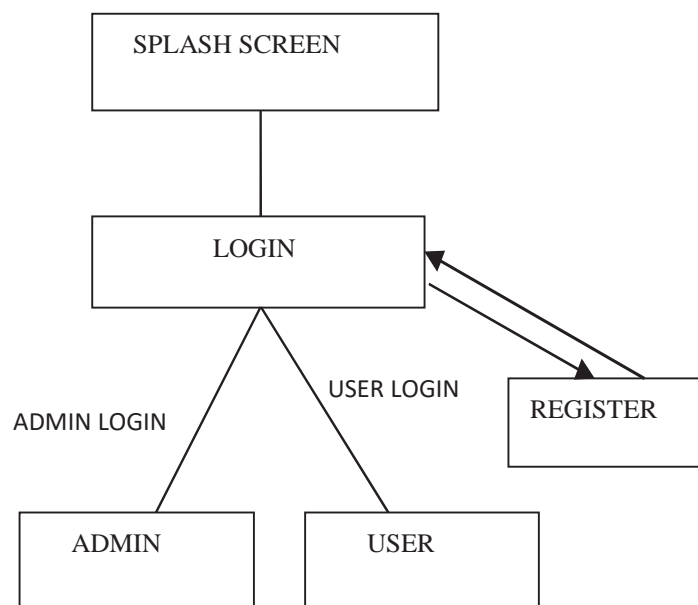


Figure 3.3: Application Flow

If the user is within that area then the application disables the camera and prevent the user to access the camera directly or via any other application like WhatsApp, Snapchat, etc. the application also has the admin module that can enable the camera at any point and update the settings. The user interface flow is shown in above figure.

3.3 Architecture of LBS systems

In Pull-based model, a Location Proxy sits between client application and LBS application. When the client initiates LBS request to the LBS application, his/her location information is attached to the request by Location Proxy and then forwarded to LBS application. In this case, location aware service is delivered while the client pulls the information from services. Usually Location Proxy is integrated into a middleware infrastructure upon which service is deployed, such as IBM Websphere Everyplace Suite. This model facilitates LBS developer in building and deploying LBS applications in the sense that the location retrieving is transparent and existing application could be converted to location-aware ones easily.

In Poll-based model, LBS application actively sends location request via well defined or industry standard location interface to location server (LS), which is responsible for getting the location of requested client. In this model, LBS application keeps polling LS or queries LS on demand in order to answer questions from client.

The advantage of this model is that more advanced location functionalities (such as periodic location report supported by LIF and WAP) could be supported and a standard location interface makes widely distributed location aware computing (e.g., location Web Service) possible.

In Push-based model, the LBS application pushes location-aware information to client according to the user preference by tracking the position of mobile users. Push model enables the scenario of delivering right information to right people on right time at right location.

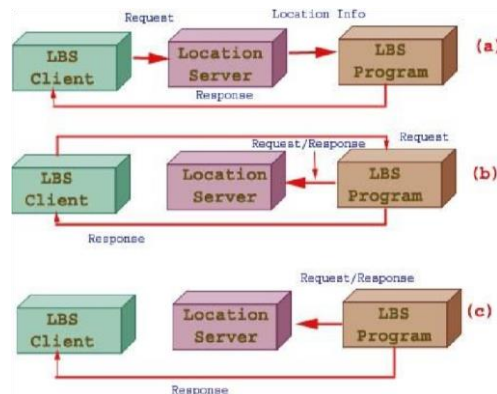


Figure 3.4: Three Models of LBS Services

3.3.1 Architecture of A-GPS system

In the last few years, the smart phones (Android, Black berry and iPhone) have taken over the market of Nokia based Symbian Phones in India. And these smart phones come equipped with A-GPS functionality which provides the spatial coordinates of the user location.

Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoor and outdoor, responds faster, and uses less battery power.

Assisted GPS [6], also known as A-GPS or AGPS, improves the performance of standard GPS in devices connected to the wireless network. A-GPS enhances the location granularity of cell phones (and other connected devices) in two ways:

By helping in finding a faster "time to first fix" (TTFF). A-GPS acquires and stores information about the location of satellites via the cellular network hence the information does not need to be downloaded via satellite.

By helping position mobile device when GPS signals are not strong or not present. GPS satellite signals may be impeded by tall towers, and they do not penetrate building interiors well. A-GPS uses proximity to cellular towers to calculate location when GPS signals are unavailable.

It addresses signal and wireless network problems by using assistance from other services. Such a technology in our smart phones can assist in various ways like tracking current location, receiving turn-by-turn direction instructions, route tracking, etc.

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Figure 3.5 Architecture of A-GPS System

Mostly suited for mobile devices, A-GPS takes assistance from GPRS and at times, the service provider network information, to pin-point the current location accurately. Moreover the amount of CPU and programming required for a GPS phone is reduced by diverting most of the work to the assistance server instead.

A typical A-GPS enabled cell phone uses GPRS or other such Internet based data connection to build a contact with the assistance server for A-GPS. As this technique does not take into account the cell phone service provider network completely, we only pay for the GPRS usage charges and nothing else. The only down-side to this technology is that an AGPS server cannot utilize any of the three standby satellites available for GPS connections.

AGPS minimizes the amount of memory and hardware that must be integrated into mobile devices in order to provide GPS-quality device locating ability as required by mobile devices. This keeps the mobile device simple and allows longer battery time. GPS is real-time solution provider whereas AGPS is not.

It is useful only for locating a particular place in small area. There is no privacy in GPS and A-GPS since the Assistance server knows the location of the device.

There needs to be communication over the wireless for processing of GPS information so this could be expensive.

3.4 LBS Programming in Android

Android provides access to the following components to facilitate the implementation of LBS services;

1. Location Manager
2. Location Provider
3. Geocoding
4. Google-Map

3.4.1 Location Manager:

LocationManager class of android is present to manages all other components needed to establish a LBS system.

3.4.2 Location Provider:

Location provider represents the technology to determine the physical location i.e. to handle GIS. LocationProvider component of Android application is a present to facilitate the determination of available provider and selection of suitable one. Finding the List of Available Location Provider

To get a list of names for all the providers available on the device, call `getProviders`, using a Boolean to indicate if you want all, or only the enabled, providers to be returned:

```
boolean enabledOnly = true;
```

```
List providers = locationManager.getProviders(enabledOnly);
```

In addition to this GPS provider and Network provider can be accessed directly by using the static variables defined in the LocationManager class:

LocationManager.GPS_PROVIDER LocationManager.NETWORK_PROVIDER

Furthermore for finding the provider on the basis of some criteria we can use the criteria class and then can find the best provider for defined criteria using the BestProvider Method as shown is the following code snaps:

```
Criteria criteria = new Criteria(); criteria.setAccuracy (Criteria.ACCURACY_COARSE);  
criteria.setPowerRequirement(Criteria.POWER_LOW);
```

```
// more criteria here
```

```
String bestProvider = locationManager.getBestProvider(criteria, true);
```

If more than one provider is available fulfilling the given criteria then the one with best performance is returned. On the other hand if no provider is found for the defined criteria then criteria are loosened in order Power use, Accuracy, Ability to return bearing, speed, and altitude.

3.5 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 is the following code block

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

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

For reverse geocoding we use getFromLocation method with geocoder variable as shown is the following code block //geocod is geocoder variable

```
addresses = geocod.getFromLocation(latitude, longitude, 10);
```

3.6 Google Map in Android:

Android provides a number of objects to handle maps in LBS system like MapView which displays the map. To handle this a MapActivity class is there. To annotate map it provides the overlays class. Even it provides canvas by which one can easily create and display

multiple layers over the map. Moreover, sufficient provisions are there to zoom the map, localize the map by means of MapController.

Following code-line shows the Map Handling in Android:

```
<com.google.android.maps.MapView android:id="@+id/map_view"
/>
```

```
//specify different attributes
```

```
// map controller
```

```
MapController mapController = myMapView.getController();
```

```
mapController.setCenter(point); mapController.setZoom(1);
```

```
//List of present overlays
```

```
List<Overlay> overlays = map View.getOverlays();
```

```
// adding a new overlays
```

```
MyOverlay myOverlay = new MyOverlay();
```

```
overlays.add(myOverlay); mapView.postInvalidate();
```

Following figure shows a map on android set with overlays:



Figure 3.6: Map on Android with Overlays

CHAPTER 4

Applications and Outcomes

5.1 LBS (Location Based Services)

Location Based Service (LBS) is a platform that provides information services based on the current or a known location, supported by the electronic map platform. The location information (latitude and longitude coordinates) of mobile end user can be obtained through the mobile communication network or the Global Navigation Satellite Systems (GNSS). The research focusing on LBS is vast and a number of these services have been implemented and tested. Tourist information systems are ideal examples for such applications, for example, Tourist Guide project, Cyber Guide project and Pin Point Tourist Guide. These systems offer information to tourists taking into account their current locations.

Location Based Services (LBSs) provide personalized services to the subscribers based on their current position using Global Navigation Satellite System (GNSS), Geographic Information System (GIS) and Wireless Communication (WC) technologies. LBS offers modern world the tool for efficient management and continuous control. More and more people involve LBS in their industry and day to day life to better achieve their goals. The increasing demand for commercial LBS has driven scientists to focus on more accurate positioning solutions. It employs accurate, real-time positioning to connect users to points of interest and advises them of the current conditions such as traffic and weather conditions, or provides routing and tracking information using wireless devices. It is important to integrate the mobile computing technology and the GIS technology in order to meet the needs of LBS, which is considered one of the most promising applications of GIS.

Location-based service (LBS) provides a user with contents customized by the user's current location, such as the nearest restaurants/hotels/clinics, which are retrieved from a spatial database stored remotely in the LBS server. LBS not only serves individual mobile users, but also plays an important role in public safety, transportation, emergency response, and disaster management. With an increasing number of mobile devices featuring built-in Global Positioning System (GPS) technology, LBS has experienced rapid growth in the past few years.

4.2 Context Aware Games

Context Awareness is another variation of LBS specially used in games. For example in a game if playing environment and circumstances are generated according to the profile of current operator then the game becomes more interesting and attractive. This is an example of CAS based system. Often it is used interchangeably with LBS but actually it is somewhat different from LBS. Context Awareness is a concept of performing operations depending upon the contrast. If the contrast is a location then this is said to LBS. CAS can bring benefits in game. And with the advancement in the mobile games CAS is a good and attractive feature to make the game more interesting and attractive. In this article we will use the CAS only for location contrast.

4.3 Location Tracking Services

Location-tracking service is the second occasion of LBS application. The Locationtracking service system for the children or the elderly has been developed for safety purpose . Besides, CyberMinder is an intelligent reminding service, which allows the user to define complex conditions. Whenever a combined condition is fulfilled, the system generates a message box alert with voice. For example, day is through Monday to Friday, time is 8 AM, and location is "home", all conditions above are fulfilled will generates a reminder "It time to go to work".

4.4 Location based CAS in games

Though CAS is not a new technology currently, however, applying CAS in games is still new. Young people prefer new things and will try new things, thus, CAS provides this chance. In the same way, CAS in mobile phone serious game is still new, and this new element can arise people's desire in engaging.

CAS game can bring new experiences in game. CAS game can bring some 'accidents', for instance, when players go to certain places, they will meet enemies while they move to others, they may get some ammos. In order to finish the game or meet the game scenario, players have to move everywhere; and tradition mobile phone game cannot provide this experience.

In the same way, LBS can make mobile phone serious game more realistic. For instance, a LBS serious game requires players get 'flats' along the road guided by digital map. When players engage, they can learn how to identify directions.

Thirdly, LBS game provides new development opportunities. The competition among developers is sharp. CAS can be a new element in mobile phone game and extend the game development scope. CAS provides new opportunities for some existing developers or new entrants to rise.

LBS game provides one more opportunity for developers to create new kinds of mobile phone game.

4.5 Other Applications of LBS

LBS is a concept that can be utilized widely. LBS can be applied in public and safety industry, such as emergency service in medical tracking industry, such as fleet management; personalization information industry, such as query the nearest restaurant; navigation industry, such as digital map; payment and so on. It can be particularly powerful when combined with other user profile information to offer personalized and location sensitive responses to customers; this form is called the context aware system. Some instances can be described below.

4.6 Emergency, Safety and Medical/Health Services:

Many governments are moving to require cellular operators to develop the capability to automatically identify subscribers' locations in the event of an emergency. This data would then be forwarded to the appropriate public safety answering point to coordinate the dispatch of emergency personnel.

4.7 Information Services:

A query about local theaters might be extended to focus only on those playing a specific movie. Or, rather than look for particular types of businesses, a customer may input a specific product, and ask for all businesses in the area that carry it. If the database includes other product information, such as prices and other terms, then real time comparison shopping may be feasible en route or even inside stores.

4.8 Navigation/Routing:

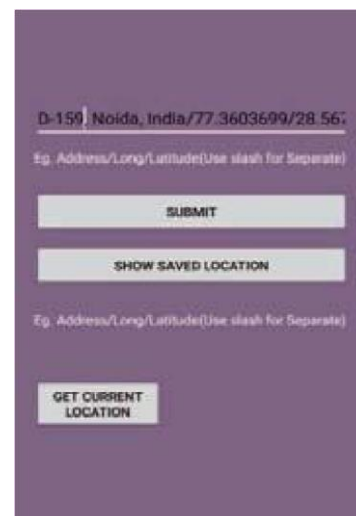
In addition to identifying the location of various destinations, LBS can also be employed to guide users along the best routes. If integrated with real time traffic data, such route guide services may also make routes contingent on current traffic conditions.

4.9 Outcomes and Results

At different location, the application was tested and it can be observed that application disables the camera between 0.45 Km to 0.59 Km. There is a slight delay for the application to continuously get the GPS location via network.

S.No.	Latitude	Longitude	Distance at which camera enables (In km)
1.	77.360627	28.566992	0.58
2.	77.200042	28.323897	0.54
3.	77.191651	28.340324	0.47
4.	77.219833	28.631020	0.53
5.	77.193406	28.34146	0.56
6.	77.217231	28.628862	0.57
7.	77.131583	28.381269	0.51
8.	77.051881	28.303792	0.53
9.	77.20033	28.33507	0.51
10.	77.094541	28.505480	0.55
11.	77.07364	28.38501	0.58
12.	77.362452	28.56816685	0.54

13.	77.134685	28.364722	0.59
14.	77.124986	28.375769	0.48
15.	77.072091	28.385759	0.54
16.	77.13335	28.35599	0.58

Table 4.1. Observation Using GPS**Figure 4.1 Submit Location****Figure 4.2 See Saved****Fig 4.3. Security Restriction****Figure 4.4 Admin Login**

CHAPTER 5

CONCLUSION

After Crime is increasing rapidly; there is a need of security to be considered. Keeping this aspect in mind this application is developed for the security of certain organizations in which leakage of any information is dangerous. Smartphones have both advantages and disadvantages and being a portable device, crime can be easily committed through them. Any individual can click pictures of important or private documents which can harm the security of an organization. Thus, there are numerous companies that do not allow individuals to carry phone at work due to the risk of loss of information that harms the privacy of the company.

This application thus fulfils the need for security. The application uses GPS, LBS that allow the user to save the office location and on reaching the saved location, the camera will be disabled. Though the enabling of the camera at that location is in the hand of the admin and only the admin can uninstall the application. Therefore, the security of the organization remains intact.

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