

Location Based Services with Location Centric Profiles

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Abstract

Android operating system supports most applications in today's technical world. It is an open source operating system which highly satisfies the user's needs. In this paper, the applications that are location based i.e. the applications that make use of the Global Positioning System (GPS) is discussed. It is a space based satellite navigation system which provides details of time and location in all weather conditions anywhere on or near earth.

Keywords: location based services; location centric profiles

Introduction

In the pre-smart phone era, cell id's and cell towers were used to find the location of the phone. It has been replaced by the GPS which provides the users with information about their current location and nearby landmarks. GPS is used to search for various places all over the world and nearby places as well [3]. GPS uses triangulation method for calculating user's exact location [6]. The Global Positioning System gives the exact longitude (line parallel to the standard meridian) and latitude (line parallel to the equator) which informs the user about his/her current whereabouts.

The GPS concept became a widely deployed and very useful tool for tracking, scientific uses, etc. Global Positioning System is completely based on time. The satellites carry atomic blocks which are very stable and synchronized. GPS satellites

transmit the data continuously which provides the current time and position. A GPS receiver coordinates with a number of satellites and equations are solved based on the values received to determine the accurate position of the receiver and its time delay. The localization techniques have recently started to demonstrate significance in performance. Real life comparative experiments given to find the efficiency in classifying GPS localization.

A Location Based Service is an entertainment or information service accessible to mobile devices through the mobile network and utilizing the ability to make use of the geographical position of the mobile device. LBS are used in many contexts such as health, indoor object search, work, entertainment, personal life, etc. LBS can be classified into different categories [1] such as

- a) Consumer Services
- b) Emergency Services/public safety
- c) Maps Navigation
- d) Marketing/advertising

Applications of LBS

LBS are widely utilized concepts. It can be implemented in public and safety industry such as emergency service in medical, tracking industry such as fleet management, query the nearest restaurant, navigation with digital maps, payments and so on.

1. Traffic coordination and management
2. Shopping
3. Job dispatch and fleet management
4. LBS games and entertainment
5. News to location

Examples of LBS based android applications

1. Personal location tracking by family member (SMS)
2. nearest friend's notification reminder etc.

Some of the examples of LBS [1] are:

- Requesting information about nearest hospitals, petrol pumps, etc.
- Requesting information about ATM's or restaurants nearby.
- Traffic related information.
- In future a system can be implemented for municipal waste with the help of GIS. [11]

Location correctness

Spotter protocol is used to verify the user's location. There will be a secret key generated for getting the particular location using LCP (Location centric profile).

It aggregates over the profiles of users that visited discrete locations. A decentralized solution is needed for computing real time LCP over the profiles of collocated users. A single database is maintained which holds all the LCP's and its corresponding matching ID's.

LCP correctness

LCP is altered by user in two ways. One or more counters are modified and at least one counter is modified or corrupted. To detect the invalid shares key values are signed by the providers.

Existing System

The existing system is to find the location only using GPS and the service provider [2]. The GPS sends to the mobile device a combination of latitude and longitude like X, Y axis which informs the user about his/her current location [6]. This system only finds the corresponding location using GPS. It fails to make any changes in any other application installed in the smart phone. It does not change or update any application depending on the location of the mobile device, such as alarm notification, changing profile, managing sound automatically, etc. Thus, the full potential of the Global Positioning System remains unfulfilled.

The traditional methods were:

GSM Localization:

GSM localization means finding the location of a mobile device in relation to its cell site. It involves multi-iteration of the signal from cell towers serving the mobile device.

Near LBS:

This method uses the local range technologies such as Bluetooth, WLAN, infrared, etc to match devices to nearby services.

Control Plane Locating:

Service providers get the location of the mobile device based on the radio signal delay of the closest cell phone towers (for phones without GPS).

Disadvantages

The system only finds the corresponding location using GPS (combination of latitude and longitude). This is completely a manual system where there is no notification after reaching particular location. Profile is changed based on time.

Proposed System

Location services provide the user location based services such as profiling. Profile of mobiles like configuration parameters for many things and examples of profiles are silent, outdoor etc. People needs to manage these profiles as per their schedule but needs to be done manually and always needs an update after the action is over, thus an application is proposed to solve this problem. In the proposed system user manages profile automatically .This is based on the location

centric profiles (LCPs) i.e. on latitude and longitude values. A database is maintained which contains some of the LCPs and corresponding locations. The user creates a profile for each location and can also create many profiles. In the proposed system user needs to select a location in which the profile, ringtones and wallpapers that has to be changed. Once when the saved location is reached, a background task will be running to calculate the distance between current and saved locations (as shown in fig1). When the certain range is reached, the profile will be automatically changed according to user.

System Design Architecture

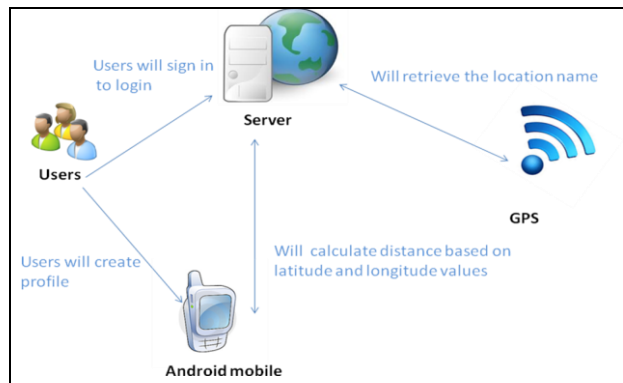


Fig1: Switching of mobile profile using location based on GPS

The System mainly consist of three modules in the following order:

- 1.creating new profile
- 2.getting gps
- 3.wallpaper
- 4.ringtone

Creating New Profile

A profile is created using this module which contains name, wallpaper, ringtone, location of destination. The number of profiles created depends upon the user. The user can choose the attributes based on location (as shown in fig2). Once done this profile is saved and can be used when required. A message is displayed that new profile has been created. The user can create any number of profiles. A created profile is displayed in the list

Getting GPS

In this module, through GPS the location should be fetched. The location address is automatically detected through the gps and displayed. The user needs to press the pin icon which will display the current location. The icon is to be dragged to get the

destination location after the current location is displayed.the adrees of the location is saved in the profile.

Wallpaper

This module helps the user to choose the wallpaper for the mobile by showing list of options or default settings or from memory card.The choosen wallpaper will be displayed in the profile when the particular location is reached.

Ringtone

The assignment of ringtone is done through this module just like the wallpaper.The user can even choose silent mode based on the area of location.Once the profile is saved it is automatically updated.

Use case diagram of the system

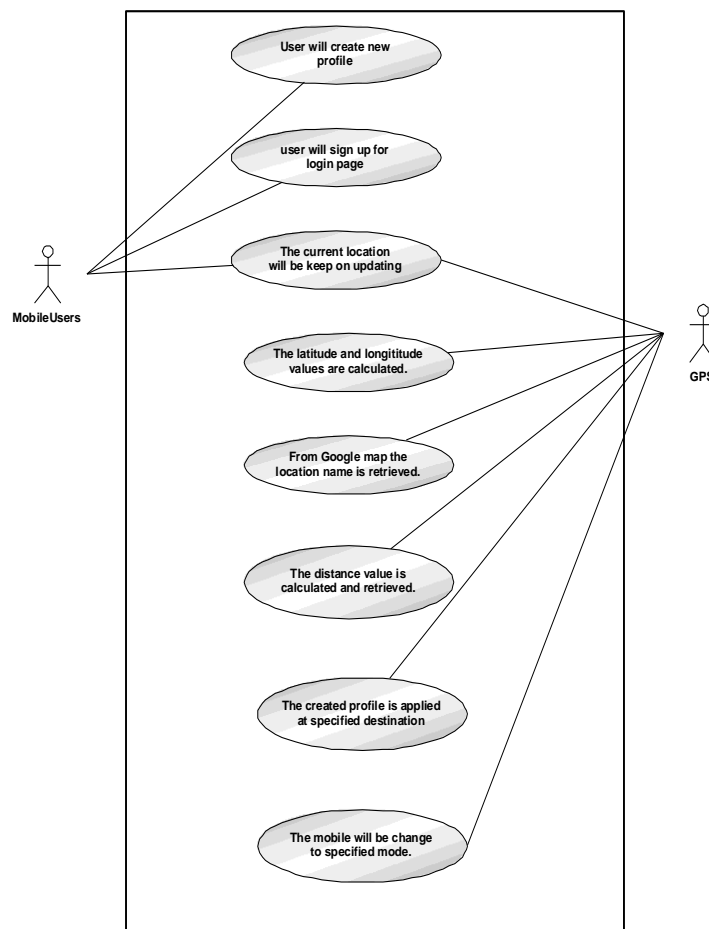


Fig2 Creating a new profile using GPS

Advantages:

The location is found by using GPS and Service Provider too .This is an automatic system where the profile mode is changed with alarm notification. Volume and wallpaper are also changed. Many numbers of profiles can be created. n number of locations can be saved. Location is fetched accurately.

Conclusion

In today's improvising world, people tend to reduce their work effort and also save time. This application intelligently and accurately provides services as per locations reducing human efforts. It maintains location information within its neighborhood region defined as neighborhood update (NU), updating its location information to the distributed location server network which is also called location server update (LSU).In this way a systematic way of profile changing according to GPS coordinates occurs automatically making the user more convenient. Hence the automatic switching of mobile profile offers a unique way of tracking locations and managing different user profiles according to need.

Future Enhancement

The proposed system can be further enhanced by introducing automatic messaging feature which can be used to send message automatically to a predefined recipient when certain location is reached and the same can be done through alerts. A group can also be created consisting of users of a particular location so that whenever a user of that group reaches a predefined location set for that group, it would automatically manage user profiles.

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