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Role of Cationic Micelles and Reductant for Solar Energy Conversion and Storage in Photogalvanic Cell

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Abstract

This paper proposes and implements a GPS tracking system using spherical law of cosines. The proposed system allows a user to view real-time positioning and tracks of a mobile handset. It reads the current GPS location of the mobile handset using GPS receiver integrated in the device and stores the information in a server. The system also allows the user to view messages that are received and sent through the mobile handset. It also allows the user to view calls that are made and received by the mobile handset. It is very useful for office management and can protect the company from naive employees.

Keywords: SQLite, GPS, Google APIs, Latitude, Longitude.

Introduction

This paper aims at using an android mobile technology [1-5] to record calls, text messages and position of the person. Android relies on Linux version 2.6 for core system services such as security, memory management, process management, network stack, and driver model. The kernel also acts as an abstraction layer between the hardware and the rest of the software stack. Every Android application runs in its own process, with its own instance of the Dalvik Virtual machine. Dalvik has been written so that a device can run multiple VMs efficiently. Android uses SQLite [6,7] which is a powerful and lightweight relational database engine available to all applications. Android uses GPS to track the location of a person [8]. The Global Positioning System (GPS) is a satellite based navigation system that can be used to locate positions anywhere on earth. It consists of Satellites, control and monitor stations, and receivers. GPS receivers take information transmitted from the satellites and uses triangulation to calculate a user's exact location. The proposed system makes use of 3G, WI-FI, Edge to collect the user information. As per the Information and Communication Technologies Authority (ICTA), there are billions of mobile phone subscribers and Mobile Internet Subscribers (GPS,3G) which makes a huge market for launching a useful application to track the records of a mobile user.

With the changing Mobile Technology, a lot of features beside mere phone calls are offered. Today, mobile phones can provide a lot of features, such as staying connected to social networks, viewing emails, browsing internet from anywhere in the world, geographical location services. Hence a mobile symbolizes the world in your hand. A mobile phone can also provide a pool of valuable information about it's owner's behavioral pattern.

Hence this paper aims at providing an android application to track the handset usage activities of it's owner.

Basic Definitions

Application Framework :

It has several components. It is a tool kit that all applications use, ones which come with mobile device like contacts or sms box or application written by Google and any android developer.

Application Layer :

At the top of android architecture we have all the applications, which are used by the final user. By installing different applications, the user can turn his mobile phone into the unique, optimized and smart mobile phone.

Activities:

An activity has a visible user interface. For example, a text messaging application might have one activity that shows a list of contacts to send messages to, a second activity to write the message to the chosen contact, and other activities to review old messages.

Kernel:

The kernel also acts as an abstraction layer between the hardware and the rest of the software stack.

Services:

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A service does not have a visual user interface which runs in the background for a period of time. For example, in order to collect the data from wearable sensors, a Bluetooth connection should be setup by using a service running in the background in the application.

Content providers:

A content provider is to manage access to persisted data which is stored in the file system or in a SQLite database. For example, a content provider will be used if you want to make contact list available to multiple activities in your application. Broadcast receivers: A broadcast receiver is a component that does nothing but receives and reacts to broadcast announcements. For example, a broadcast receiver is used to receive or send or reply a text message.

Software framework and implementation:

Android is a software development platform for mobile devices built upon a foundation of the Linux kernel. It includes library, virtual machine, application framework and key applications. The Android SDK provides the tools and APIs necessary for developing applications on the Android platform using the Java programming language.

There are many features provided by Android platform for the Android application developer. The UI subsystem includes windows, views lists and edit boxes, widgets, and an integrated browser built upon Web Kit. The connectivity options include wireless networks like Bluetooth and Wi-Fi and mobile networks like GPRS, EDGE and 3G. It provides a 2D and 3D graphics library and an embedded Sqlite database. The camera, Google Maps, GPS and accelerometers are also available in the Android. The rich development environment includes a device emulator, memory and performance profiling, tools for debugging, and a plug-in for the Eclipse IDE. Android applications do not have a single entry point for everything in the application (no main () function).

Literature Survey

1 *Integrity monitoring and threshold-based WLAN indoor positioning for mobile devices*

Author(s): Melkonyan, Arsen in 2011In this paper written by Mikoyan we proposed by integrity monitoring an thresholding based WLAN indoor positioning for mobile devices in The Global Positioning System (GPS) works well in outdoor areas, but the satellite signals are not strong enough to penetrate inside most indoor environments. Wireless LANs (WLAN) signals have been explored for more accurate positioning indoors. Contemporary WLAN positioning maintains the database of location-associated signal fingerprints which is used to identify the most statistically likely match of incoming signal data with those preliminary surveyed and saved in the database. An issue with these systems, however, is the operation robustness. This paper investigates the issue of deploying WLAN positioning software on Android mobile platforms and studies an integrity monitoring technique to account for fading signal characteristics, which are often observed in WLAN networks. Integrity monitoring algorithms exploit redundancy of access points and isolate those with corrupted characteristics to improve system robustness. Wireless LANs (WLAN) signals have been explored for more accurate positioning indoors.

2 *A service-based approach to developing Android Mobile Internet Device (MID) applications*

Author: Mayon in 2009 proposed this by a service based approach to developing android mobile internet device applications in Mobile Internet Device (MID), as a portable handheld device, becomes a strong candidate for client-side computing. Android is a mobile operating system, being accepted as the operating system and a platform for MID applications. However, MID has a limited resource and computing power and android has architecture and its components which are not commonly found in other operating systems and platforms. Hence, there is a demand for effective methodologies for modeling and implementing Android-based MID applications. Our process utilizes both object-oriented and service-oriented engineering principles while considering features of MID and the architecture of Android.

3 *Secure Mobile Business Information Processing*

Written by kuntzewe proposed by Secure mobile business information processing an ever increasing amount of functionality is incorporated into mobile phones-this trend will continue as new mobile phone platforms are more widely used such as the iPhone or Android. Along with this trend, however, new risks arise, especially for enterprises using mobile phones for security-critical applications such as business intelligence (BI). Although platforms like Android have implemented sophisticated security mechanisms, security holes have been reported. In addition, different stakeholders have access to mobile phones such as different enterprises, service providers, operators, or manufacturers. In order to protect security-critical business applications, a trustworthy mobile phone platform is needed. Starting with typical attack scenarios, we describe security architecture for Android mobile phones based on the concepts of Trusted Computing.

Proposed System

Our proposed system is based on open source technologies like PHP, MySQL, Google APIs and J2ME. It works on any internet enabled mobile phone with

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android OS connected to a host web server for tracking activities. It is a three phased approach. The first being the application that needs to be installed on mobile phones that are connected to a GPS server. Once connected, the application will send data to the server while the device is moving, receives any text messages, calls and the time of the calls and text messages.

The second part of the system is the server that collects and stores all the information received from the device on which the application is installed and allows the authorized person to view the information.

The third part of the system is in which the user can login to the web server to view the tracking information of the mobile owner. The position of the device can be viewed using Google map APIs in which the person has to enter the latitude and longitude information of the mobile position.

The proposed system uses spherical law of cosines that can calculate a distance as small as possible.

Spherical law of cosines calculates the change in location and uses the below mentioned formula to calculate the latitude and longitude of the current position of the mobile user.

$d = a\cos(\sin(\varphi_1).\sin(\varphi_2) + \cos(\varphi_1).\cos(\varphi_2).\cos(\Delta\lambda)).R$

```
var R = 6371: // km
var d = Math.acos(Math.sin(lat1) * Math.sin(lat2) + Math.sin(lat2) + Math.cos(lat1) + Math.cos(lat2) * Math.cos(lon2-lon1)) * R
```

Architecture of the Proposed System

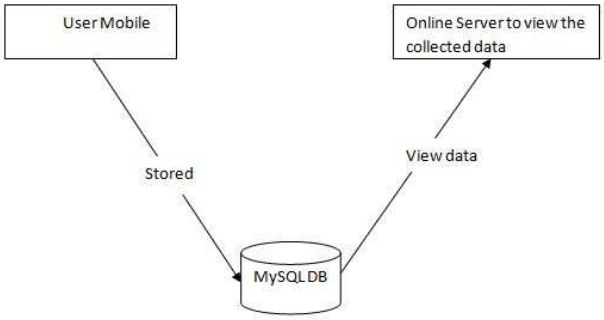

Figure 3.1 – System Architecture

Data Collection

a) Whenever a mobile user performs an activity, say, texting, calling or travelling, the entire data is stored into the database.
b) The data is collected to the database through a high-speed 3G network or WI-FI.
c) The information about the missed calls, incoming and outgoing calls, like source or destination mobile number, call duration, incoming and outgoing content of text messages, locations of the mobile can be collected into the database.

Data Storage

a) Whenever the activity is performed, it gets collected in the database through a 3G or WI-FI network.
b) The database is created online using an URL and it is the online server database. We connect the app to the URL in the code.
c) Through this link, the data is passed and stored in the database.
d) Authorized persons can login into the centralized server and view the details of the mobile usage.

Data Retrieval

a) The authorized person can later view the collected data about the mobile user's activities from the database.
b) This activity is also done through WI-FI or 3G network.
c) He can view the details in his monitor by accessing the concerned URL.
d) To access the location, he uses the itouchmap.com in which the latitude and longitude degrees are to be given which he gets from the database.

Results and Discussion

The system is implemented successfully and showed interesting results. Figure 4.1 below shows how the tracking information of the mobile owner is collected and stored on a server.

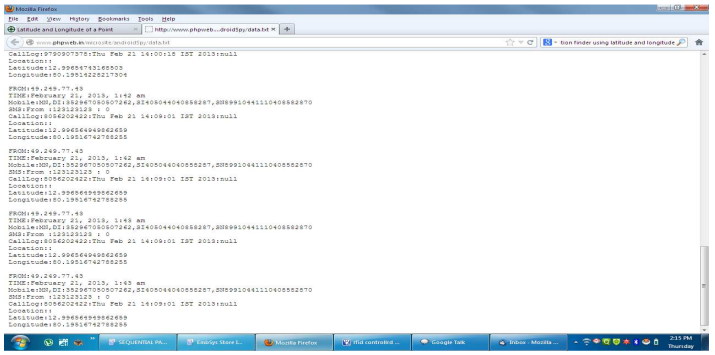

Figure 4.1 Database Server

Figure 4.2 shows how the geographical location is seen using itouchmaps.com

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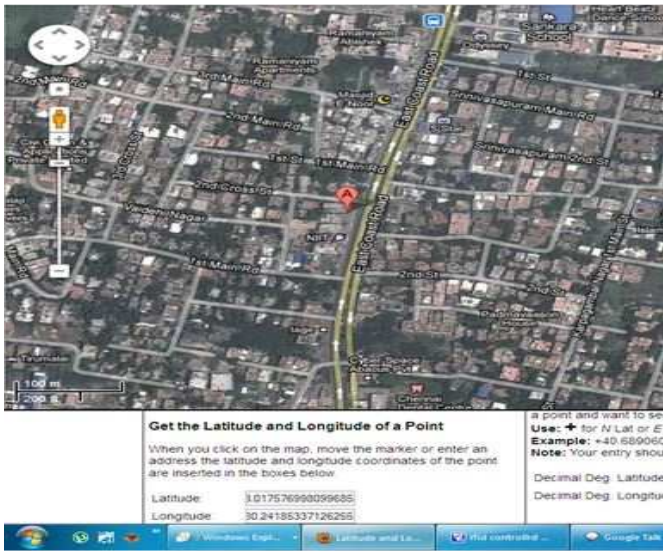

Figure 4.2 Target Location

With the proposed system, the concept is that the information of the mobile owner is tracked and stored in a online database for the authorized person to view the information later. He can view the geographical location of the mobile owner by entering the latitude and longitude information in the itouchmaps.com. The application automatically sends data to the server whenever there is a new record of tracked information.

This system was tested for a track of 50km which took around eighty minutes and the user has checked the database server and found around 200 new data and it was less than 150kb. Android has a built in capacity of data storage for every application. This application uses a very limited memory space of the application and hence it is economically efficient.

The user can get a clear overview where the device has been using the system. The system can detect a very small change in the location of the mobile unless the device is in a building.

The tracking of incoming and outgoing texts and phone calls was also tested using the system. It gave accurate results.

Conclusion

With the proposed system, a successful attempt was made to track the mobile owner's behavioral pattern. By using free Google map APIs, HTTP protocol, intelligent login and intelligent positioning calculation, the system can easily track a device. The intelligent positioning calculation reduces the amount of GPS data sent to the server. There is a distance calculation performed by the application prior to the last GPS data received. Through the system, parents can monitor their children's current location and can avoid them from being in trouble.

The proposed system though efficient in tracking the information, has some limitations. The application to be used is compatible with only android mobiles. Being connected to internet consumes lot of battery life. The system cannot give GPS location if the device is in a building or under a roof. The application cannot be installed on the mobile phone if it doesn't have the sufficient memory. The proposed system can track only one mobile handset. In the future, the application can be enhanced by rectifying the above mentioned limitations.

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