AASLTU: an Advanced System for Location Tracking and Updating

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Abstract*— A definition of tracking deals with pursual of something that involves capturing of various events such as location, persons, etc. Now a days mobile phone plays a vital role from communication to store information but when it gets lost we would disconnect. Here we introduce an application called AASLTU (An Advanced System for Location Tracking and Updating). This application will help you locate the street view of the location. This works by using GPS which will track and show the mobile in the map. This application has a web portal which will allocate credentials to every user. These credentials will be stored in the server. So by using this web portal link we can even view the location of our device from any place. This application will also reveal the last updated information of the mobile if it is in the dead state, that is, when it is switched off. When the mobile turns to active state it will start to update the current location of the mobile. We have to just install the application in our android mobile so we can view the location of the mobile from our mobile itself. This is a user friendly application where we can easily locate our mobile by having an authorized access.

Index Terms*— Global Positioning System, Global Positioning System, Location Based Service, Location Proof, Location Privacy, Pseudonym, Colluding Attacks, Delay Lock Loop, Pseudo Random Noise.

I. INTRODUCTION

Mobile devices, such as smart phones and PDAs, are playing an increasingly important role in people's lives. Location based services take advantage of user location information and provides mobile users with a unique style of resource and services. Nowadays more and more location-based applications and services provides users about their locations information. As location proof plays a critical role in enabling these applications, they are location-sensitive. The common theme across all these applications is that they offer a reward or benefit to users locating them in a certain geographical location. But users wants their exact locations to be pointed. There are many kinds of location-sensitive applications. One category is location-based access control.

Today's location-sensitive service relies on user's mobile device to determine its location and send the location to the user. Till now we can only find the area postal code. To address this issue, we propose An Advanced System for Location Tracking and Updating which works on co-located Bluetooth or WIFI enabled android mobile devices to find and update their mobile location information by using the authorized access from the server.

A web portal link is designed and credentials will be given for every user. All the user credential information are maintained in the server. The System can be implemented with the existing network infrastructure and the current mobile devices, and can be easily deployed in Bluetooth or WIFI enabled mobile devices with little computation or power cost. Extensive experimental results show that our scheme, besides providing location of the device and also maintain the updated history.

Location Services use the geographical location of mobile user equipment to offer a range of value added services to consumer and enterprise users.

Location Based technologies offer the opportunity to deliver contextual services. As such services are specifically orientated towards the position of the mobile handset it enables to provide services that are more targeted and effective.

II. RELATED WORK

Research and development of location based services has been in progress since the early 1990's. The first application of this technology was by the emergency services industry, in order to determine the location of emergency callers. The mandatory use of LBS technology for emergency location purposes began in 1996, as a result of rules issued by the US FederalCommunicationCommission.

The consumer segment picked up use of location based services not too long after the emergency community, with the first LBS-enabled mobile product being debuted in 1999. This device (the Palm VII) actually had two applications pre-loaded on the phone that utilized an individual's location to provide weather and traffic updates. The next significant development in location based service technology was Automatic Location Identification (ALI), which was first introduced by go2 and AT&T. By using ALI technology, users are able to access location-specific information without manually confirming their ZIP codes. This was integral to the development of more sophisticated applications such as turn by turn directions.

A.R. Beresford and F. Stajano [2] applied that focus on the privacy aspects of using location information in location-based services (LBSs). LBSs are services that take the current position of the user into consideration when performing their tasks. These services can be accessed from mobile phones, PDA (Personal Digital Assistant), and any other mobile device.

T. Xu and Y. Cai [4] designed a model which allows a user to express her privacy requirement by specifying a *public* region, which the user would feel comfortable if the region is reported as her location.

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The popularity of the public region, measured using entropy based on its visitors' footprints inside it, is then used as the user's desired level of privacy protection. With this model in place, we present a novel technique that allows a user's location information to be reported as accurate as possible while providing her sufficient location privacy protection.

J. Freudiger, M.H. Manshaei, J.P. Hubaux, and D.C. Parkes [5] analyzed the non-cooperative behavior of mobile nodes with a game-theoretic model, where each player aims at maximizing its location privacy at a minimum cost. By means of numerical results, we show that mobile nodes become selfish when the cost of changing pseudonym is small, whereas they cooperate more when the cost of changing pseudonym increases.

S. Saroiu and A. Wolman [12] said that any device can request a location proof from the infrastructure when it is within communication range; the recipient device can then transmit the proof obtained from the infrastructure to any application that wishes to verify the device's location

III. IMPLEMENTATION

Location information is identified by using geographical representations through latitude and longitude points. We implement An Advanced System for Location Tracking and Updating in which co-located Bluetooth or WIFI enabled mobile devices mutually generate location proofs, and update to a location proof server. We can find the exact location of the mobile by using a web portal accessed by a Server by simply login the username and password.

The proposed system introduces An Advanced System for Location Tracking and Updating where the information of identified location is presented as a "street view" along with the area code (nearest tower information). The exact latitude and longitude position is also identified. It does not rely on the wide deployment of network infrastructure or the expensive trusted computing module. Another feature of this system is providing "location history". The previous locations are saved. This is helpful when the mobile's location is continuously varied.

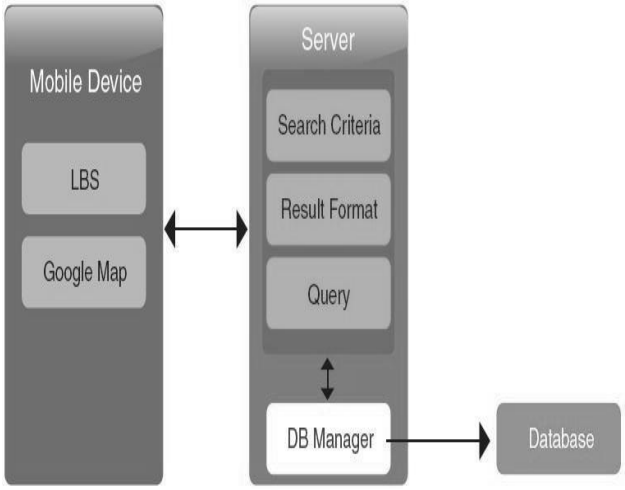

Figure 1: System Architecture

First we have to download the .apk in mobile. After downloading the application, install it in mobile. Then register your details for login. Once you register you will get the credentials for login. After signing in you can find the location either by check in manually or through the search option. You can also check the previous updated information, can take photo of any distinct location and you can share the uploaded photo among your friends.

The process involves the following methods to develop the system.

Location Based Service

GPS Tracking utilizes your phone's internal GPS hardware to obtain an accurate reading of the location and transmit it .This applications allows you sharing your GPS location.

Allow Android device users to share their exact location by way:

- Readable address:

Readable address is a simple tool that can help you find the approximate address of any point with Area code, Street Name, Nearby Location.

- Google Map Link:

Locate where your Android device is in real time using a high resolution map viewable on any web browser.

Location Proof

As our goal is not only to monitor real-time locations, but also to retrieve history location proof information when needed, a location proof server is necessary for storing the history records of the location proofs. It communicates directly with server to submit the location proofs. As the source identities of the location proofs are determined, the location proof is displayed to the user.

Location Privacy

This module concentrates on the authentication of the user. The user is provided with a username and password with which he can access the application. These credentials are stored in the server and these cannot be hacked by any attacker. Once the user registers with the credentials he himself cannot change them. So it is important for the user to remember the username and password because it cannot be also rectified.

Colluding Attacks

The collusion attack is an action carried out by a given set of malicious users in possession of a copy of protected content that join together in order to obtain the information. The attack can happen when an unauthorized user tries to use the application. The application supports a strong anti-attacking mechanism.

Algorithm

Kalman Filter Algorithm

The Kalman Filter Algorithm is used to filter the location of the device. Kalman filter based tracking algorithms for GPS software receivers are presented. To provide proof of concept, data was collected using a Android GPS. The recorded data was used to show that the new Kalman filter based algorithms outperform traditional tracking methods. The Kalman filter based algorithms introduced in this thesis provide an alternative to the Costas loop and DLL (Delay Lock Loop). The task of tracking the PRN sequences is handled by a single Extended Kalman Filter (EKF).

The EKF is used to estimate the user's position in the Earth-Centered Earth-Fixed (ECEF) coordinate frame. Using the EKF's estimates, the code phases of the PRN (Pseudo Random Noise) sequences being received from the different satellites are predicted.

Estimates of the code phase error between the predicted and received codes are generated using discriminator functions. The estimates of the code phase errors are used to update the EKF's estimates of the user's navigation states. To provide proof of concept, data was collected using a Spirent GPS simulator. The recorded data was used to show that the new Kalman filter based algorithms outperform traditional tracking methods.

IV. CONCLUSION

Location-based services have made their way into a great deal of the technologies and applications many consumers use on a daily basis, now factoring into mobile web search engines and even social networks.

Faced with an increasingly difficult challenge in the growth of the technology and numbers of subscribers, wireless carriers and their partners are developing a host of new products, services, and business models based on data services. Location services, which provide information specific to a location, are a key part of this portfolio.

Thus this paper presents an application which is used to find the lost device, update the location where we are now and upload the picture of location proof. This is used to passport enquiry and address proof verification. We can find the exact location of the mobile by using a web portal accessed by a Server by simply login the username and password. Using location update system we can gather all related information about the citizen. That information uploads and updates directly from the location

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