



Mobile Tracking Application for Locating Friends using LBS

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Abstract: In today's fast moving life services based on location has very much importance in everyone's life. As the trend is of smartphones, mobiles, iPhones, and all the gadget emerging today it's very important for the mobile user to have the location based services. Location based service can be elaborate as the services which uses the users geographical location which consist of X and Y coordinates, which is generated by GPS which acts as positioning device. This paper called mobile tracking application for locating friends using LBS, which uses the GPS as location provider through geographic location for mobile network. Nowadays security of woman's is at the stake in our country this application includes anti-theft facility for the woman's or the user which is using the app so that his location information is send the geographically nearest police station. This implements the client server system that helps the user to locate and track their friends, and receive the alert message when nearby, basing on radius set by administrator. Frontend application coding is done in J2ME and MYSQL database used to update the location information and track the location.

Keywords: Location Based Service (LBS), Global Positioning System (GPS), J2ME, MySQL, Tracking, Navigation, Emergency based services.

I.INTRODUCTION

Location-based services (LBS) applications that provide information to users based on their location are a growing business. From social networking to navigation to banking, consumers are being offered a range of new location-based services. But every time a consumer uses one of these services, there is a risk that the company offering the service may be collecting and retaining detailed records of who she is, where she goes, and what she does. Once collected, outdated privacy laws and varying corporate practices can leave this sensitive information vulnerable to access by the government and third parties.

Location based services are used more frequently by the mobile users. A location based service is a location provider that is used to track the location of any mobile node through the mobile network that includes vehicular tracking system called fleet net. In mobile communication the tracking of location plays a major role using this LBS services. In order to track the location of the user's mobile device it checks the nearest base station available to the mobile network and GPS Global Positioning System for tracking location. The GPS satellite is used for navigation purpose and it is combined with LBS is used to track the location of mobile device and the actual work of GPS is to calculate the position in the measure of coordinates like latitude and longitude values through the GPS receiver. In general this GPS works in open space areas only and used for radio navigation purpose through radio signals the GPS is a small device that can be embedded in any devices like mobiles.

The mobile that is embedded with GPS receiver calculates the exact longitude, latitude and altitude values and those values can be used by LBS for finding the location .GPS also provides information like time for calculating sender and receiver locations based on the information received from the satellites. Using GPS receiver in the mobile device we can even set the navigation path from source to reach a particular destination .Three satellites may be enough for computing the position of mobile devices.

II.WORKING

The application makes use of a mobile phone or PDA which is provided with GPS receptor and GSM network. This application enables the user (a) to track a mobile device and send alerts messages to a predefined number via short message service (SMS) if the mobile device is not present in the specified radius or in an interest location radius (b) to send distressed calls to a predefined number via SMS by just pressing one key from the keypad (c) for detecting an unauthorized SIM card in the mobile phone and to send a warning message via SMS from the current GSM cell and GPS position. mTracker also maintains a record of the positions which are already monitored. This allows the users to check when and where the mobile device was located using Google maps. The application uses two user profiles the administrator and the user to be tracked.



The application is implemented as a client server system that helps users to locate their friends and receive alerts when friends are nearby. The application works in open space areas only since it relies on GPS by calculating the longitude and latitude values of the mobile. Future extensions may look at other options such as getting the location from the service provider. In this case the location accuracy will be reduced and will depend on the size of the cells where the user is located.

The main purpose of this paper is to boost the accuracy of positioning system in cellular networks. Two methods are proposed to achieve this aim, a two-step position determination method and a one-step method. Here constrained optimization is used to minimize the cost function. Mobile velocity and heading angle information is used for improving the accuracy of the position. In the two-step position determination method, the position determination is performed as the first step by applying optimization technique with NLOS mitigation to produce initial position estimation. Mobile track geometry or motion direction information and mobile velocity are used to reduce the position errors. In one-step position determination method a position determination scheme is proposed which handles the two processes in one step.

The Mobile station is connected to satellites that retrieve the information about coordinates using GPS and network base station tracks the location from server base station of location database. The proposed scheme utilizes the two-step Least Square method for estimating the three-dimensional position (i.e. the longitude, latitude, and altitude) of the mobile devices. The Kalman filtering technique is introduced to eliminate the measurement noises and to track the trajectories of the mobile devices. The simulation result shows the consistent location estimation accuracy under different environments.

In order to achieve the minimum weight conditional variance of importance weight and get more accurate estimation of sight condition, the optimal trial distribution is used. Then by applying decentralized Kalman filtering method, the mobile state could be analytically computed. In the parameter learning step, sight conditions are updated according to the measurement and the estimation and mobile state. Simulation results show that this method could achieve a good tracking performance and the NLOS parameters can be effectively inferred.

The second technique is based on angle of arrival which requires only two base stations. Providing accurate time estimations and angle of arrival is mostly degraded by multipath fading. It has highlighted the problem of multipath fading in providing accurate estimations of time and angle of arrival and it has compared the effect of location geometry on TOA and AOA in terms of their GDOP.

The measurement of signal power at a base station is called a power map which is a non-linear function of the position of a mobile. The purpose of Bayesian bootstrap filtering approach being used here is to cope with the nonlinearity. The author assumed that the mobile is mounted on a vehicle so that the mobiles movement is restricted in a road. Here the signal power measurement at several base stations are compared with the power maps at each position. Large errors may be there in the power maps or the measurement if the mobiles movement is not restricted to a particular road or area

III. PROPOSED SYSTEM

Mobile tracking facility is not available in the existing system which forces the user to specify the location details by him turns as the major drawback. The application facilitates mobile users in finding services available in specific location such as discovering the nearest restaurant or nearest hospital etc.

The applications of this type are restricted for the service providers of mobile devices. The reason for this is that they use mobile cells information for getting the mobile's location. Mobile phone tracking tracks the current position of a mobile phone even on the move. To locate the phone it must emit at least the roaming signal to contact the next nearby antenna tower.

The main aim of this work is to design and implement a client server system that helps users to locate their friends and family members through mobile. It tracks the user location information using GPS and sends a message to the user about his location.

The user will be provided with an alert message about his friend's location when his friend is within a couple of meters to the user. The user can be navigated to his destination dynamically using this application. It also helps the user when he is new to some place by knowing his location on the spot.

It reduces the task of searching the particular location manual search. Using GPS the user can know his present location coordinates and if the user moves to other location automatically the coordinates will update and changes the location information in user mobile device. Any type of user can use this application efficiently.

IV. METHODOLOGY

The main objective of the proposed system is tracking location. The end user can find his friends location through this service. The location is tracked using GPS and display the coordinates. The User is independent in accessing the data. The main intention of this application is to help the user to reach his destination by finding locations through GPS. Any type of user can use this application efficiently without any risk factor. The location can be tracked based on the radius maintained by the administrator.

The client-side system is a MIDlet application which serves as an interface to feed in the contents and control instructions which is interpreted on the server and the appropriate action is taken. The MIDlet has the task of creating design page for Welcome Page, User Registration, User Login, Add Member, and Family/Friends Request.

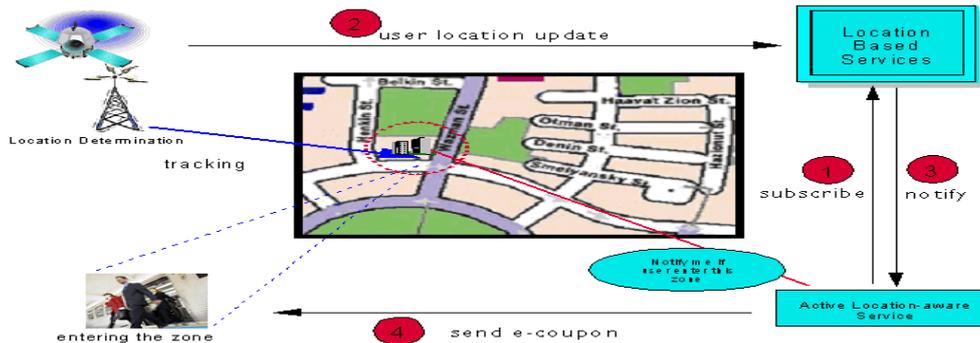


Figure 1 Methodology

Welcome page contains two fields that are IP Address and status of user. IP Address is used for connecting the server to the mobile client using Stream Socket Connection. For the connection the remote desktop IP address is given in the mobile and the desktop IP address will be stored temporarily. The status of user is used for determine the process future. If the user is new then he has to select the User Registration option or else he can select the User Login options.

Only the registered users can use this service. So the users should register his user name and password which will then be sent to the server. Once the user registered then he can login to the service by entering the username and password. User can also add any number of registered users to his list as a friend or friend member.

The server also gets user location coordinates and stores it in the database and then it calculates the distance between two mobile devices that is two friends or family members based on the coordinates information stored in the database and sends alert message if the friends are nearer to each other.

In order to update the user location in server, the mobile request the location of the user from GPS. The GPS determines the longitude and latitude and sends the information to the mobile phone. Therefore in order to build a location based application we need java MID2.0 enabled and JSR 179 compliant mobile phone. The mobile phone should have a built-in GPS unit.

V. LOCATION BASED SYSTEMS

Location-based services (LBS) applications that provide information to users based on their location are a growing business. From social networking to navigation to banking, consumers are being offered a range of new location-based services. But every time a consumer uses one of these services, there is a risk that the company offering the service may be collecting and retaining detailed records of who she is, where she goes, and what she does. Once collected, outdated privacy laws and varying corporate practices can leave this sensitive information vulnerable to access by the government and third parties. What are the privacy implications of LBS, and how can businesses, policymakers, public interest groups, and consumers work together to update the laws and create stronger policies so that consumers can feel confident using these services?



Figure 2 Location Based Systems

LBS are rapidly expanding in both number and variety. They offer a wide range of services: navigation tools to help you reach your destination (e.g., MapQuest); local search to help you find nearby businesses or events (e.g., Yelp); friend finders and social networking (e.g., Loopt and Google Buzz); applications that allow you to check in at certain locations (e.g., foursquare); and applications that can link your location to other activities (e.g., Twitter and Facebook). Many users currently access LBS through mobile phones, but location-aware devices such as laptop and desktop computers, iPads, and in-car navigation and assistance systems can also be used to access many of these services.

LBS offer tailored services that respond as you move from one place to another. But by using LBS, consumers may unknowingly allow companies to compile detailed problems of their lives: the places they visit, the events they attend, the people they meet, and more. And if LBS assemble these consumer problems, other parties especially the government may be eager to access this sensitive personal information. Americans should not be forced to choose between using new technology and keeping control of the private details of their lives. Instead, they have the right to expect that new technologies will improve their lives without invading their privacy.

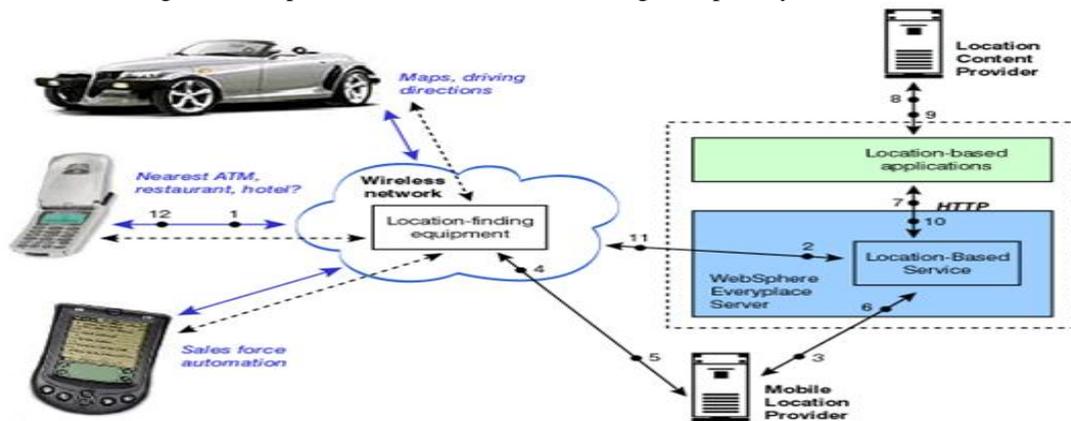


Figure 3 LBS Working

Unfortunately, legal protections have not kept pace with technological change. Constitutional privacy protections have yet to account for the fact that LBS are capable of generating detailed records that may reveal intimate and personal facts about a person’s life, facts that are rightly considered private. Existing privacy statutes were written decades ago, before LBS even existed. And many LBS privacy policies do more to protect company interests than to safeguard consumer privacy. As a result, the privacy protection for information collected, held, and shared by LBS providers is often inadequate or uncertain. As LBS become more popular and more central to the way Americans interact with technology and with each other, ensuring that there are strong and clear protections for the information they collect will be essential to building consumer trust, ensuring the long-term success of LBS, and protecting privacy.

VI. EMERGENCY SERVICE FOR WOMAN SECURITY

Nowadays security of woman’s is at the stake in our country this application includes anti-theft facility for the woman’s or the user which is using the app so that his location information is send the geographically nearest police station.

When user feel unsecure then this application will provide save our souls like facility with the click of just one button it will give the location information to the nearest police station and to the parent mobile number whose static location and contact information is already stored in our database based on the location of the user’s location it will choose the nearest police station.

VII. WHY J2ME?

Emerging wireless technologies are opening up a brand new market for new styles of applications and services targeted at consumers and enterprises. Java technology provides a comprehensive foundation that allows next generation devices to offer new capabilities such as enhanced interactivity, rich user interface, offline processing, local data storage, and networking. By utilizing these new capabilities, developers and enterprises can create new exciting services in the wireless market.

This article provides an overview of the benefits provided by Java technology in the wireless world, and how this solution overcomes the challenges presented by the variety of mobile phones and PDA solutions, evolving network technologies, and the requirements for easy to use, secure applications.

VIII. J2ME BENEFITS ON WIRELESS DEVICES

Let's look at how Java technology fits in the wireless service evolution. Originally, analog technology was sufficient to handle voice services, but the quality of the calls was sketchy and multiple radio networks competed with one another.

Today we take advantage of the second generation of networks and services (2G networks), which use digital networks and web browser technologies. This provides access to data services, but markup languages present some limitations. Markup languages are a step in the right direction, but browser-based applications don't work when out of coverage-require air time for even simple operations (such as entering appointments in browser-based calendar) - offer a limited user interface paradigm (character-based, static black and white images, cumbersome navigation interface). When Java technology is added to this environment, it brings additional benefits that translate into an enhanced user experience. Instead of plain text applications and latency associated to a browser-based interface, the user is presented with rich animated graphics, a fast interaction, the capability to use an application online, and maybe most interestingly, the capability to dynamically download new applications to the device.

For application developers, this means that you can use your favorite programming language and your favorite development tools, rather than learning a new programming environment. There are over 2.5 million developers who have already developed applications using the Java programming language, primarily on the server side. Once these developers become familiar with the small set of J2ME APIs, it becomes relatively easy to develop small client modules that can exchange data with server applications over the wireless network.

IX. CONCLUSION

This paper introduces a mobile tracking application based on Location based service to track and locate the mobile device using geographic coordinates of the user as a location provider it helps the user to locate their friends and receive alerts. This application also ensures the security of the user, which is necessary in case if the user is woman. The objective is to track the location according to radius maintained by administrator and sending SMS to the users. Further extensions can be done in getting the location from the service provider by extending the radius and providing security to the radius in order to increase the capacity between the communicating mobile devices as a location tracker. As the Location Based services are emerging great popularity these days for marketing this application will good option in that criterion.

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