Tracking System

[1]Suryavarshini D, [2]Sumaya M, [3]Shobika Shri V S, [4]Shunmathi S
[5]Ms. M.Nithya, Assistant Professor
[1,2,3,4,5]*Dept. of Computer Science and Engineering*
Sri Krishna College of Engineering & Technology, Coimbatore.
nithyame@skcet.ac.in

***Abstract*—Mobile Application to keep track of every movement of the subject induced with GPS tracking system. A unique application that will be a milestone after the implication of the smart city as one could track the movement of any GPS connected subject be it a means of transportation, finding a friend, tracking the movement of an autistic person, aged person, a lost phone or any gadget with GPS incorporated in it. When globally connected on satellite and own a smart phone then why would any other special device be needed separately for every single task. Hence a mobile application for performing all such wide range of operations can be a brilliant form of generalisation in GPS Tracking. The implementation of this application can be done in the Eclipse platform using Java, XML and few other inbuilt functions.**

I. INTRODUCTION

With the development of wireless technology and Internet of Things, smart devices are more popular in our daily life than ever before. We use these devices recording our daily life, monitoring personal status, and tracking objects. Cloud services are commonly integrated with these devices for data collection, storage and analysis. Mobile apps are also provided as the most popular interaction interface to the device.

Location tracking devices are the most commonly used devices. These devices are embedded GPS receiver, capable of generating location data. These devices are favored in vehicle tracking, law enforcement and differently abled people monitoring.

In this paper, we propose a location tracking framework, composed of a tracking device, a backend server, and a mobile app. The tracking device embedded with GPS receiver can generate location data in real time. This device integrated with TCP/IP stack is capable of accessing Internet and uploading location data. The device is not equipped with keyboard or screen due to power and portability consideration. Device control relays on the server and app. A server side system is implemented to collect data and validate control command. We also build a mobile app to access data, display location on a map and control device remotely. Specifically, we integrate a walking stick with our tracking device. This walking stick is a real-world product for elderly people. Their family members can locate and monitor their locations with our app.

This paper focus on the design and working process of the whole framework. In Section II, we present some related works on location tracking system. In Section III, we give a detail description of the whole system, including tracking device, backend server, and mobile app. Section IV presents some optimization that can be applied to our system.

Overview of GPS

The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. It is maintained by the United States government and is freely accessible by anyone with a GPS receiver. The GPS consists of three parts: the space segment, the control segment, and the user segment. The U.S. Air Force develops, maintains, and operates the space

IJSER

and control segments. GPS satellites broadcast signals from space, which each GPS receiver uses to calculate its three-dimensional location (latitude, longitude, and altitude) plus the current time.

The space segment is composed of 24 to 32 satellites in medium Earth orbit and also includes the boosters required to launch them into orbit. The control segment is composed of a master control station, an alternate master control station, and a host of dedicated and shared ground antennas and monitor stations. The user segment is composed of hundreds of thousands of U.S. and allied military users of the secure GPS Precise Positioning Service, and tens of millions of civil, commercial, and scientific users of the Standard Positioning Service (see GPS navigation devices.

Domain and Basis of the method

Android

A free, open source mobile platform.A Linux-based, multiprocessing, Multithreaded OS. Android is not a device or a product It's not even limited to phones You could build a DVR, a handheld GPS, an MP3 player, etc.Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language.

Keeping the size of applications and features in check is of paramount importance to the J2ME developer. That's wheresmall-sized XML parsers come into play.

II. LITERATURE REVIEW

1) An Innovative Method using GPS Tracking, WINS Technologies for Border Security and Tracking of Vehicles

This system provides security to the mother land by using concepts of Wireless Integrated Network Sensors, GPS tracking and object and metal detection and tacking of vehicles with in the country. It provides a new monitoring and control capability for monitoring the borders of the country. Using this concept we can easily identify a stranger or any object crossing the border where the army cannot reach in regular. Using the satellite communication and GPS tracking the area will be identified. By Object identification system we will be able to get the pictures of that particular area where the strangers has come as well as the details of objects or people who are present there. And later the metal detecting sensors and bomb detection signals will detect the existence of explosives and weapons(metals) with them. The border area is divided into number of nodes. Each node is in contact with each other and with the main node. The noise produced by the foot-steps of the stranger is collected using the sensor. This sensed signal then sends appropriate signals and the frequency measured by that sensor to the main node. Thus the stranger is identified at the main node. Hence it is reasonably faster. On a global scale, WINS will permit monitoring of land, water, and air resources for environmental monitoring. With this we will be able to identify the objects and the movement, direction of their movement and the kind of metals they have. After discussing with the military authorities we will be able to plan the actions to be taken against them. Presently the Indian government is planning to implement the same technology for tracking the vehicles with in the country which carry illegal commodities (like government issued sugar , rice to be distributed among masses but send to other states without legal permission). The vehicles which carry explosive materials for industrial purposes can be tracked. The missing vehicles during transportation due to various reasons(terrorists attacks) can be easily identified.

2) Techniques for Efficient Road-Network-Based Tracking of Moving Objects

With the continued advances in wireless communications, geo-positioning, and consumer electronics, an infrastructure is emerging that enables location-based services that rely on the

tracking of the continuously changing positions of entire populations of service users, termed moving objects. This scenario is characterized by large volumes of updates, for which reason location update technologies become important. A setting is assumed in which a central database stores a representation of each moving object's current position. This position is to be maintained so that it deviates from the user's real position by at most a given threshold. To do so, each moving object stores locally the central representation of its position. Then, an object updates the database whenever the deviation between its actual position (as obtained from a GPS device) and the database position exceeds the threshold. The main issue considered is how to represent the location of a moving object in a database so that tracking can be done with as few updates as possible. The paper proposes to use the road network within which the objects are assumed to move for predicting their future positions. The paper presents algorithms that modify an initial road-network representation, so that it works better as a basis for predicting an object's position; it proposes to use known movement patterns of the object, in the form of routes; and, it proposes to use acceleration profiles together with the routes. Using real GPS-data and a corresponding real road network, the paper offers empirical evaluations and comparisons that include three existing approaches and all the proposed approaches.

3)Location tracking in GPS using Kalman Filter through SMS

The location tracking algorithm with velocity renovation process has been implemented in this paper. The velocity renovation process consists of velocity estimator and direction having higher accuracy in estimated velocity for Kalman filtering. The implemented algorithm reduces the location estimation error to 0.57 meter.Theory works on the basic physics formula of speed is equal distance by time. Using this formula one can just formulate the distance captured from the gps and the time can be plotted through GST timings. There by an inbuilt function for the speed calculation can be pre-programmed and executed for Velocity determination. We present a novel technique to send GPS coordinates to other mobiles through short message service (SMS) based on Global Positioning System (GPS) technology. Two algorithms,Kalman filter and velocity renovation, which can be used in conjunction with GPS are used as a basis for location tracking. This technique can be used to help people, using their mobile with or without GPS, to find the location of a friend using Google maps. The first coordinates are generated from a GPS assisted mobile on Google map, this location is then sent through SMS to another person. The latter can then see the exact location of the sender on his map with an accuracy of 0.57 m . The advantages of this technology is by using existing equipments and free services like Google maps and GPS, we can construct a very reliable location tracking system. The basis of this program is GPS. GPS is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the United States (US) Department of Defense (DoD). GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use. GPS can show you your exact position on the Earth in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS. The improved location tracking algorithm which uses the Kalman filter with the velocity renovation process is implemented. The velocity renovation process consists of a velocity estimator and direction finder. By this process, the proposed algorithm can use accurately estimated velocity in the location estimation.

III. PROBLEM DEFINITION

The existing schemes become inapplicable for location tracking due to the deficiency of signal sources. In this paper, two predictive location tracking algorithms are proposed to alleviate this problem.The first coordinates are generated from a GPS assisted mobile on Google map, this location is then sent through SMS to another person. The latter can then see the exact location of the sender on his

IJSER

map with an accuracy of 0.57 m . The advantages of this technology is by using existing equipments and free services like Google maps and GPS, we can construct a very reliable location tracking system. The basis of this program is GPS.

In this system, a device is equipped with a global system for mobile communications (GSM) modem and a GPS unit. It transmits short messages containing its GPS coordinates to the server at30-s intervals. Although transmitting the geo-location information of a target via wireless networks is effective when both the target and the tracker are within Wi-Fi coverage area, the 802.11 wireless networks are not always accessible. When the target or the tracker is unable to access Wi-Fi, it is impossible to perform location tracking.

Therefore, SMS is a relatively more reliable and flexible solution because of its wide spread use. However, SMS is a user-pay service. The transmission cost of a tracking system by the number of SMS transmissions while maintaining the location tracking accuracy is high.

IV .PROPOSED SYSTEM ARCHITECTURE AND MODULE EXPLANATIONS

In this System, a novel method called location-based delivery (LBD), which combines the short message service (SMS) and global position system (GPS). LBD reduces the number of short message transmissions while maintaining the location tracking accuracy within the acceptable range. The proposed approach, LBD, consists of three primary features: Short message format, location prediction, and dynamic threshold. The defined short message format is proprietary. Location prediction is performed by using the current location, moving speed, and bearing of the target to predict its next location. When the distance between the predicted location and the actual location exceeds a certain threshold, the target transmits a short message to the tracker to update its current location. The threshold is dynamically adjusted to maintain the location tracking accuracy and the number of short messages on the basis of the moving speed of the target.

V. IMPLEMENTATION

In this System, a novel method called location-based delivery (LBD), which combines the short message service (SMS) and global position system (GPS). LBD reduces the number of short message transmissions while maintaining the location tracking accuracy within the acceptable range. The proposed approach, LBD, consists of three primary features: Short message format, location prediction, and dynamic threshold. The defined short message format is proprietary. Location prediction is performed by using the current location, moving speed, and bearing of the target to predict its next location. When the distance between the predicted location and the actual location exceeds a certain threshold, the target transmits a short message to the tracker to update its current location. The threshold is dynamically adjusted to maintain the location tracking accuracy and the number of short messages on the basis of the moving speed of the target.

VI. CONCLUSION AND FUTURE ENHANCEMENT

A handful of studies have developed location tracking applications through SMS. However, SMS is a user-pay service. The number of SMS transmissions must be minimized while maintaining the location tracking accuracy within the acceptable range to reduce the transmission cost. This study proposes a novel solution, LBD, to this problem, and further develops a realistic system for tracking the target location. In addition to defining the short message format, LBD uses the current location, speed, and bearing of the target to predict its next location. In LBD, the moving pattern information of the target is transmitted only when the distance between the predicted location and the actual location exceeds a certain threshold, which is dynamically adjusted according to the speed of the target. The experiment shows that, in LBD, the number of short messages required is significantly

IJSER

reduced as compared with TBD and DBD. In addition, LBD achieves an acceptable location tracking accuracy. Finally, the use of a dynamic threshold reduces the required number of short message transmissions compared with the fixed threshold.

Future Work

In this evaluation, we have assumed that a target moves erratically at low speed. Thus, the proposed LBD finds potential applications for elderly care and childcare. In addition, LBD
Is used in car monitoring and tracking applications because it works under the condition that the target moves at a high speed. However, further studies are required to verify these applications.
A notable limitation is that LBD can only track one target at a time. We extend this work for future studies on monitoring multiple targets simultaneously by taking into account additional value-added services.

VII. REFERENCES

[1] U. Bareth and A. Kupper, "Energy-Efficient Position Tracking in Proactive Location-Based Services for Smartphone Environments," 2011 IEEE 35th Annual Computer Software and Applications Conference, Munich, 2011, pp. 516-521..

[2] Y. Ozen, O. Ozdemir and N. Bandirmali, "Android based energy aware real-time location tracking system," 2015 Seventh International Conference on Ubiquitous and Future Networks, Sapporo, 2015, pp. 842-844.

[3] P. A. Shinde and Y. B. Mane, "Advanced vehicle monitoring and tracking system based on Raspberry Pi," Intelligent Systems and Control (ISCO), 2015 IEEE 9th International Conference on, Coimbatore, 2015, pp. 1-6.

[4] Kim Wooju, "Android Position Tracking in Proactive Location-Based Services for Smartphone Environments," 2011 IEEE 35th Annual Computer Software and Applications Conference, Munich, 2011, pp. 516-521..

[5]Michele Facca, Federico. Luca Lanzi, Pier. "Mining interesting knowledge from web logs a survey". Data & Knowledge Engineering.Accepted for publication. 2004.

[6]Hsu, Jeffrey. "Data mining trends and developments The Key Data Mining Technologies and Applications for the 21st Century".Proc. of ISECON 2002.

[7]Chakrabarti, Soumen. "Mining the web discovering knowledge form hypertext data". San Francisco, CA. Morgan Kaufmann Publishers An imprint of Elsevier Science 2003. pp 1-13.

[8]Arotaritei, Dragos. Mitra, Sushmita. "Web mining a survey in the fuzzy framework".Fuzzy Sets and Systems vol. 148, 2004. pp 5–19.

[9]Larsen, Jan. Lars Hansen, Kai.Szymkowiak Have, Anna. Christiansen,Torben. Kolenda, Thomas. "Webmining learning from the World Wide Web".Computational Statistics & Data Analysis. 38. 2002. pp 517–532.

[10]Eirinaki, Magdalini. Vazirgiannis, Michalis. "Web Mining for Web[19]. Gatetrade.net. Information on gatetrade.net and some of their solutions Marketplace Personalization". ACM Transactions on Internet Technology vol. 3, no.1, 2003. pp 1–27.

[11]DeYoung, Colin G. Spence, Ian. “Profiling information technology users en route to dynamic personalization". Computers in Human Behavior..Vol. 20. 2004. pp 55–65.

[12]B. Falkenhainer and R. Michalski, Integrat-ing Quantitative and Qualitative Discovery The ABACUS System", Machine Learning, 1(4) 36701

IJSER

[13] C.Calvin and B.Britto, "Monitoring and tracking system " Intelligent Systems and Control (ISCO), 2015 IEEE 9th International Conference on, Coimbatore, 2016.

[14] Joshua Dragos. Mitra, Sushmita. "Web mining a survey in the fuzzy framework".Fuzzy Sets and Systems vol. 148, 2004. pp 5–19.

IJSER