Tracking Context of Smart Handheld Devices

Ms.Manju P*, Ms.Vismaya U*, Ms.Sathiya KK*,Mrs.Kowshika A**,
*UG Scholar, Department of Information Technology, SNS College of Engineering, Coimbatore.
**Assistant Professor, Department of Information Technology, SNS College of Engineering, Coimbatore.

Abstract

Surveillance systems and location prediction are becoming important for monitoring the human mobility. In a cellular network predicting human mobility remains a challenging task due to mobility patterns. Based on this a prototype named GloCal is developed which refines the global positions to structure the locally measured ones. The system aims to enhance the location prediction based on the dead reckoning techniques. The proposed system provides a notification about human on their activities and location. TEC (Total Electron Count) estimates the uncertainty to increase the space environment awareness. The error detection of the decoded navigation data is done by Parity Algorithm equations.

I. INTRODUCTION

In today's world, people want everything to happen at high speed and on their hands. Mobile became a most important part of people life. Peoples want the information stored on system on their mobile at anytime, anywhere. This allows user to retrieve information from any place easily [1]. In order to solve the shortcomings of traditional surveillance system, this project proposes a surveillance scheme based on android smart phone. This system makes it possible to monitor target site anywhere and anytime via android smart phone under the coverage of wireless network. A monitoring scheme prototype based on android smart phone terminal. By collecting and processing data at server, sending data to smart phone terminal via Web Services, it satisfies the purpose of monitoring the target site anywhere and anytime under the coverage of wireless network and enhances the flexibility of surveillance system greatly [2].

Android is an open source phone operation system based on linux platform and it's the first truly open and complete mobile software for mobile terminal. Android as server platform, allows multiple users to use applications via network [9].

In the existing system user fetches the information from the service provider. In order to reduce the cost we use Broadcast Receivers which simply respond to broadcast messages from other applications or from the system itself. There are following two important steps to make Broadcast Receiver works for the system broadcasted intents 1) Creating the Broadcast Receiver 2) Registering Broadcast Receiver. If the signal is too week for the receiver to extract even the satellite navigation message, the necessary data can be sent to the receiver using cellular telephone network, which also can supply timing information to help the GPS receiver acquire signals more quickly.

II. PROPOSED SYSTEM

All incoming and outgoing calls, text and multimedia messages can be seen and interrupted by the superintendent, who can also monitor where the human are through GPS. It allows to access a history of where they have been stored even if the human are going outside a geographical zones or receiving texts and calls from banned persons.

The smart phone-enabled dead reckoning supports accurate but local coordinates of users trajectories, while GPS provides global but inconsistent coordinates. The project device techniques to refine the global positioning results by fitting the global positions to the structure of locally measured ones, so the refined positioning results are more likely to elicit the ground truth.

The project develops a prototype system, named GloCal conduct comprehensive experiments in both crowded urban and spacious suburban areas. In the tracking phase the mobile application developed in Android using the mobile phone GPS receiver fetches the GPS location, after calculating the exact location it further creates a GPRS packet which includes the location details with a unique identifier called International Mobile Equipment Identity (IMEI) number and timestamps details.

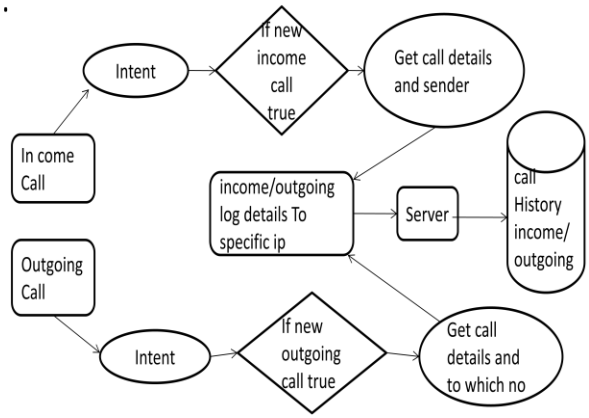
Even though human can delete the call log and SMS details manually this system helps Manager to monitor the incoming and outgoing call, text messages of their human mobile phone. Content of the message and log can be viewed by their superintendent, even though the human changes their number. It provides a low cost human tracking system.

III. SYSTEM OVERVIEW

A. *Architecture*

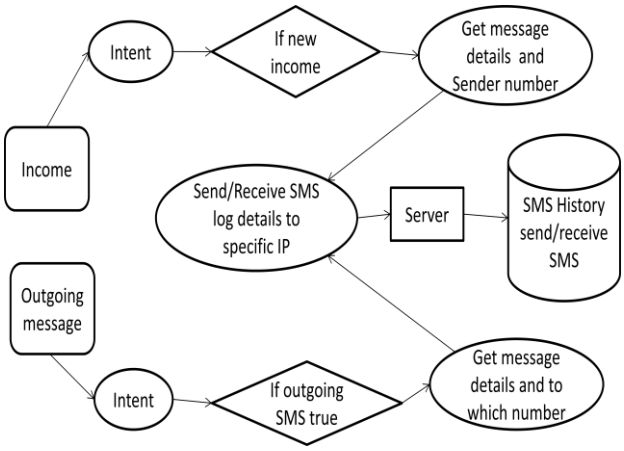
B. *Monitoring and Alerting about Calls.*

The system allows Manager to monitor their Employee activities with the help of mobile phone incoming calls and outgoing calls. When there is call for Employee mobile the manager will receive an SMS alerts from the Employee's android based mobile. The SMS contains information about the person who have called or else for whom they have called, and also exact time the call has been done.



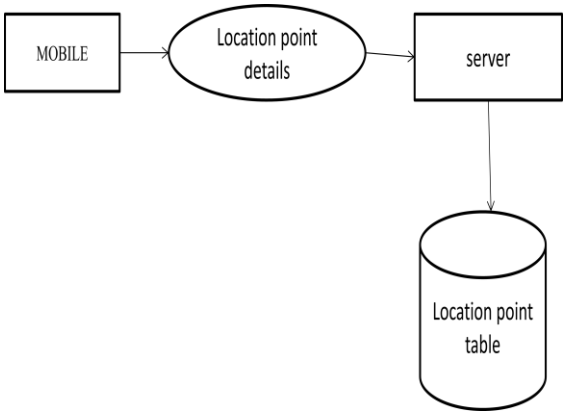
C. *Monitoring and Alerting about SMS*

The Manager can monitor their Employee cell phone incoming SMS and outgoing SMS activities by receiving SMS alerts from the Employee android based mobile device. In this it additionally sends the information about the persons who are all sending and receiving SMS and also the time which has been sent and along with time and content transferred.



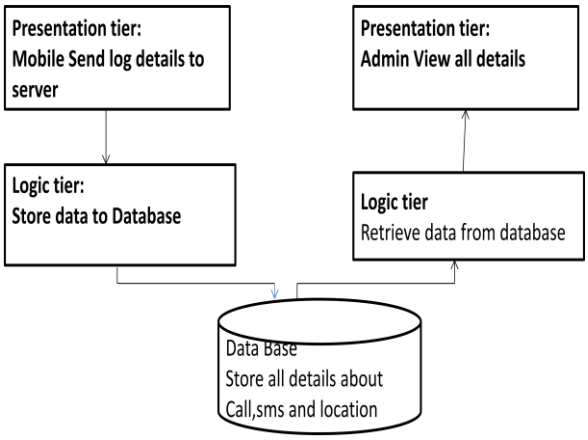
D. *Monitoring and Alerting About Current Location (Through GPS)*

It has been designed to track the current location of the Employee through GPS. So that the Manager can also monitor the Employee where ever they have traveled and also the current position. It gives timely update of the Employee current location as an SMS alert to the Manager mobile.



E. *Maintaining the Details in the Centralized Server*

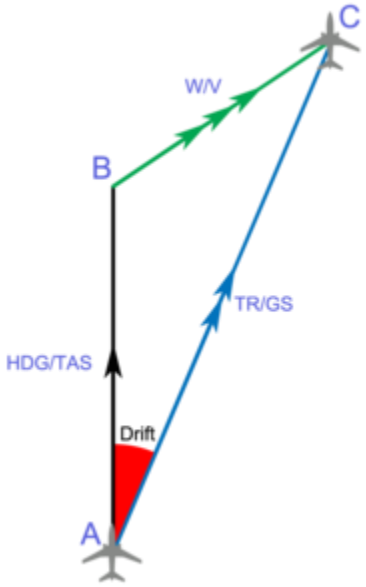
Mobile log details such as call, SMS and location will be stored in the database and it can also be viewed as a SMS in Manager's mobile phone. Manager can also retrieve the data from database.



IV. ALGORITHM

Dead Reckoning

In navigation, Dead Reckoning or DR is the process of calculating one's current position by using a previously determined position, or fix, and advancing that position based upon known or estimated speeds over elapsed time and course. The corresponding term in biology, used to describe the processes by which animals update their estimates of position or heading, is path integration[11].



Dead reckoning is subject to cumulative errors. Advances in navigational aids that give accurate information on position, in particular satellite navigation using the Global Positioning System, have made simple dead reckoning by humans obsolete for most purposes. However, inertial navigation systems, which provide very accurate directional information, use dead reckoning and are very widely applied.

Counting

Total Electron Count (TEC)

This measure used to characterize the conductivity of the ionosphere, which consists of ionized layers of the upper atmosphere. Free electrons in the ionosphere affect the transmission of radio waves by absorbing and reflecting, which slows the propagation of radio signals through the ionosphere. Estimates of the TEC can be used to correct for transmission delays in GPS signals, which can be incorporated in GPS receivers for more accurate location estimates.

GPS Synchronization Algorithm (parity algorithm)

The user must perform error detection of the decoded navigation data using the parity algorithm equations provided .presents an example flow chart that defines one way of recovering data (dn) and checking parity. The parity bit D*30 is used for recovering raw data. The parity bits D*29 and D*30, along with the recovered raw data(dn) are modulo-2 added in accordance with the equations appearing in Table 2-14 for D25 . . . D30, which provide computed parity to compare with transmitted parity D25 . . .D30.

Coordinate Transformation

A coordinate transformation algorithm is introduced to achieve effective transformation between local and global coordinate system, which is agnostic to the specific localization techniques used. In other words, given two groups of localization results with different accuracy, the algorithm is universally capable of improving the precision of the less accurate one in its coordinate system.

Fixed Interval Algorithm

The fixed interval algorithm is derived from a GPS functionality that is commonly used. As the name indicates, the algorithm sends specific data to the database server after every fixed interval of time, i.e., it uses one variable to keep track of the time change in the mobile asset and relates it with frequency. It knows at what time the last point was reported and when the next point will be sent.

Radius Algorithm

The radius algorithm is mainly related with the distance between the tracked points, it deals with points that are within a specified radius from the device. It keeps track of the last location data reported to the database server and the distance between the last and the current location. Only if the value of the calculated

distance is more than a certain predefined distance, the device sends the current point to the server. Along with the radius variable it also involves the fixed time interval, using which it checks the frequency to send the data.

V. DISCUSSION

In existing system call log and SMS details can be deleted, so the content of the message cannot be monitored. Content of the message cannot be monitored. Exact location of the human cannot be known to superintendent. The proposed system has been made effective by overcoming the drawbacks by providing easier human tracking system. Manager can have more clear decision in order to take necessary steps to avoid the employee unnecessary activities.

VI. CONCLUSION

The combination of both the technologies i.e. GPS and GPRS provides a constant, continuous and real time human tracking system. The cost of the overall system has been reduced by two facts one is using the existing mobile phone and another is using GPRS.It has been hoped that the use of the overall system can eliminate the requirement of first the traditional GPS receivers and second the costly SMS based tracking systems.

REFERENCES

[1] Atul R. Ghumare , Nivedita D. Patil , Chetan D. Holkar, Vivek D. Badgujar "Peer to Peer Communication between Android Device and PC and Video Surveillance using Android Device" ISSN: 2321-8169 Volume: 3 Issue: 1

[2] Abhishek Barve , Pragnesh shah "Android based Remote Monitoring System"(2012) Proceedings published in International Journal of Computer Applications® (IJCA) (0975 – 8887).

[3] Antonio Portolan, Krunoslav Zubrinic and Mario Milicevic "Conceptual Model of Mobile Services in the Travel and Tourism Industry",International Journal of Computers Issue 3, Volume 5, 2011.

[4] Haitham Hassanieh ,Fadel Adib , Dina Katabi , Piotr Indyk " Faster GPS via the Sparse Fourier Transform"MobiCom '12,August 22-26, 2012.

[5] Jian Qiu, Xizhe Wang, and Guojan Dai " Improving the Indoor Localization Accuracy for CPS by Reorganizing the Fingerprint Signatures" ,International Journal of Distributed Sensor Networks Voluma 2014, Article ID 4157010, 13 pages.

[6] Jie Liu, Bodhi Priyantha, Ted Hart ,Heitor S.Ramos, Antonio A.F. Lourerio, Qiang Wang "Energy Efficient GPS Sensing with Cloud Offloading ",SenSys'12 , November 6-9,2012, Torento, ON, Canada.

[7] Daqiang Zhang , Haoyi Laurence T.Yang and Vincent Gauthier " NextCell : Predicting Location Using Social Interplay from Cell Phone Traces" IIEEE Transactions on Computers, vol.64,No.Jan,2015.

[8] He Wang , Zhiyang Wang, Guobin Shen, Song Han and Feng Zhao"WheelLoc:Enabling Continuous Location Service on Mobile Phone for Outdoor Scenarios ".

[9] M.Toyama, S.Kurumatani, JoonHeo, K.Terada, E.Y.Chen, Android as a Server Platform, IEEE Conference on Consumer Communications and Networking Conference (CCNA), Page (s) 1181-1185, Year 2011.

[10] Rod Bryant, "Assited GPS Using Cellular Telephone Network for GPS Anywhere" , GPS World, May 2005.

[11] Bu-Sung Lee, Wentong Cai , Stephen J.Turner , L.Chen " Adaptive Dead Reckoning Algorithms for Distributed Interactive Simulation ", published by IEEE Computer Society, May 1999, Atlanta, Georgia, USA.

[12] Nainesh Agarwal, Julien Basch, Paul Beckmann "Algorithm for GPS operation indoors and downtown "GPS Solutions(2002).

[13] J.Saranya ,J.Selva kumar, "Implementation of children tracking system on android mobile terminals" Communications and Signal Processing (ICCSP), 2013