ISSN: 0975-766X
CODEN: IJPTFI
Available Online through
www.ijptonline.com
Research Article

INTEGRATION OF CLOUD & ANDROID WITH BLUETOOTH AND SOCIAL NETWORK TRACKING OF DEMENTIA PATIENTS

E. Varun Kumar*, A. Vignesh, Mrs. VijeyaKaveri
Faculty of Computing, Sathyabama University, Chennai.
Email: vkvkvarun8@gmail.com

Received on 04-05-2016 *Accepted on 30-05-2016*

Abstract

In the current system identifying the Dementia Patients is really very tough. We could not able to monitor them all time. In this project we have used the Bluetooth tracking technique to identify the dementia patients all time. Android User (Care Taker) will pair the Bluetooth Device with their Phone. If Dementia Patient gone out the Range of Bluetooth immediately User can share the Bluetooth ID to the Social Networks. People can also track using Bluetooth ID in their phone and can notify if the Dementia Patient is found.

We implement Cloud Computing in this project. An Automatic Alert is generated in case of Out of Range of Dementia patient. The Bluetooth Device connected with the patient will automatically pair with the any available Bluetooth device of nay Mobile phones so that automatically Mobile number of the Care Taker is shared. So that person can communicate with the Care Taker about Dementia Patient's Current Location.

Keywords: Location tracking; Android; Smartphone; Bluetooth Tracking.

I. Introduction

Location based services are involved in finding lost dementia patients. They are categorized as two classes of technologies: active and passive. Active technologies utilize long distance telecommunication such as a GPS tracker with GSM enabled, or a simple mobile phone.

Passive technologies utilize tags like metal or RFID, these need to be close to the target and read by sensor. Active technologies seem better, but the power consumption makes these devices need to be removed for recharging and while bathing due to water problem. It is also possible that a dementia patient does not remember to take his tag before lost.

BLE is a new proposed technology that uses very low power to be an active tag and transfers data with 100 feet when necessary.

The sleep current can be as low as 0.001mA. Kamath and Lindh [site] report that they set a BLE tag into discovery mode, and connect it with a one second interval and zero slave latency as the experiment. The result finds a connection without translate data needs the wake time from 2.675ms to 2.775ms, and spends current from 8.2463mA to 8.5321mA. Expect power usage per second is from 0.023mAh to 0.0247mAh, or the average as 0.0239mAh. So a 230mAh CR2303 battery can be expected to last for 9583 hours, or approximately 400 days0. Since a BLE works over one year if connect once every second with a CR2302 coin battery, it is possible to pack a BLE chip with a coin battery into a water-proof, un-breakable unit such as a button fixed on clothes or a bracelet to be an active tag with low price.

A BLE dealer can update new tags for his customers every year to ensure availability. A dementia patient needs not to remember to take a tracker when go out because removing it is not necessary. Unlike traditional trackers who utilize infrastructure of GSM mobile phone network; tag solutions need base stations and their own network. Fortunately, there are many main stream smart phones support BLE, and there are popular public cloud services on the Internet. We can adopt them to construct a system for tracing a BLE tag on a lost dementia patient. This system includes a BLE enabling smartphone app to find tags, register new tags in the phone or backup data to cloud. It can download tags information from cloud for those subjects need to find, and reports the location when finding a lost subject. The sever site of the system is on Google's cloud environment, with the Google Apps Script to provide restful APIs for smart phones. When an app reports a opened tag first time, it sends a SMS message to the tag owner's phone via a tele-communication system provider. All finding records are forward to the tag owner via E-mail.

II. Related Works

This section deals with some of the existing works related to the proposed mobile solution, mainly, using tracking systems through GPS or GSM cell. Sangwoo Cho et.al.[10] presents a method to track a mobile device by monitoring the signal powers of the mobile transmitter measured at several base stations. The tracking method uses a constrained Bayesian bootstrap filter with signal power measurements in order to improve accuracy.

The signal power measurement is a non-linear function of the position of a mobile. They compare the signal power measurements at several base stations with the power maps (non-linear function of the position of a mobile) to get the

likelihood at each position. This method aims mobile devices that are mounted in vehicles and the movement of the devices is restricted in a road.

Another mobile tracking approach is proposed by Chao-Lin Chen et.al. [4].It uses a hybrid location scheme, which combines both the satellite-based and the network based signals.

The proposed scheme uses the two-step Least Square method to estimate the three-dimensional position (i.e. the longitude, latitude, and altitude) of the mobile devices. The Kalman filtering technique is exploited both to eliminate the measurement noises and to track the trajectories of the mobile devices. A fusion algorithm is employed to obtain the final location estimation not only from the satellite-based but also from the network-based systems. Most of the above-mentioned systems, provide dedicate solutions using tracking methods to monitor a mobile device. But by just enabling the cell phones with GPS system and retrieving the information about the new SIM would be insufficient to track the Smartphone.

Hence came the idea of developing SAPt - A Stolen Android Phone Tracking application, an efficient and unique application with few more features which help in controlling the lost android Smart phone and retrieving it back. This application uses location-based services (LBs) like GPS or global system for mobile (GSM) network to track a mobile device.

III Existing System

In the Existing System, identifying the Dementia Patients is really very tough. We could not able to monitor them all time.

3.1 Limitation of Existing System

- Less Security
- Difficult to Find the patient
- High Time consumption

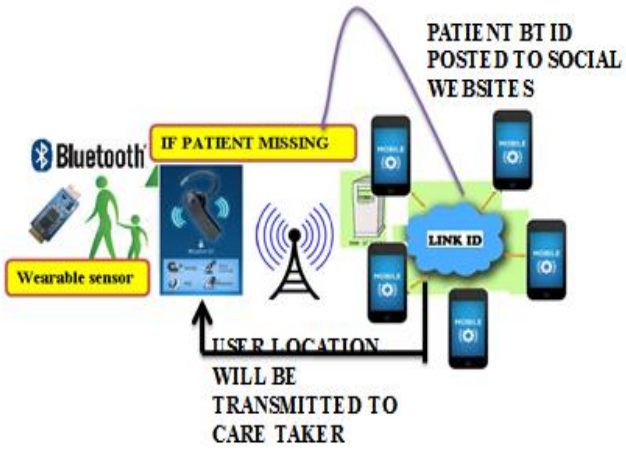
IV Proposed System

In the Proposed system**,** Bluetooth Device is connected with the Dementia Patients all time. Android User (Care Taker) will pair the Bluetooth Device with their Phone. If Dementia Patient gone out the Range of Bluetooth immediately User can share the Bluetooth ID to the Social Networks. People can also track using Bluetooth ID in their phone and can notify

if the Dementia Patient is found. We implement Cloud Computing in this project. In the Modification part, an Automatic Alert is generated in case of Out of Range of Dementia patient. The Bluetooth Device connected with the patient will automatically pair with the any available Bluetooth device of nay Mobile phones so that automatically Mobile number of the Care Taker is shared. So that person can communicate with the Care Taker about Dementia Patient's Current Location.

4.1 Advantages of Proposed System

- High security
- Easily find the patient
- Less time consumption



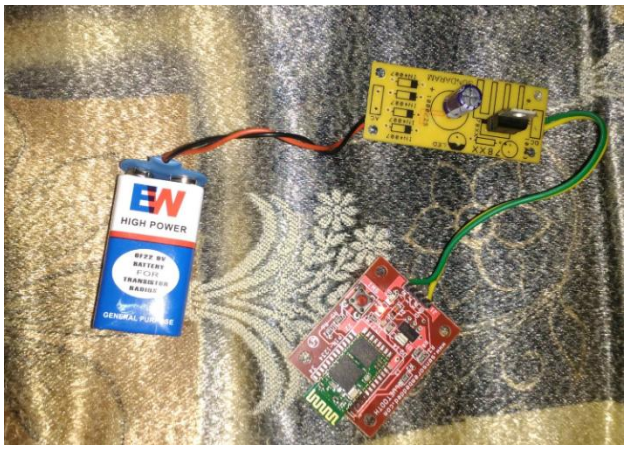
V Modules

5.1 Android deployment

Develop an android application. Develop an android application. Develop an android application for the indoor navigation is done by using Bluetooth instead of GPS (Global Positioning System). Mobile Client is an Android application which created and installed in the User's Android Mobile Phone. So that we can perform the activities. The Application First Page Consist of the User registration Process. We'll create the User Login Page by Button and Text Field Class in the Android. While creating the Android Application, we have to design the page by dragging the tools like Button, Text field, and Radio Button. Once we designed the page we have to write the codes for each. Once we create the full mobile application, it will generated as Android Platform Kit (APK) file. This APK file will be installed in the User's Mobile Phone an Application.

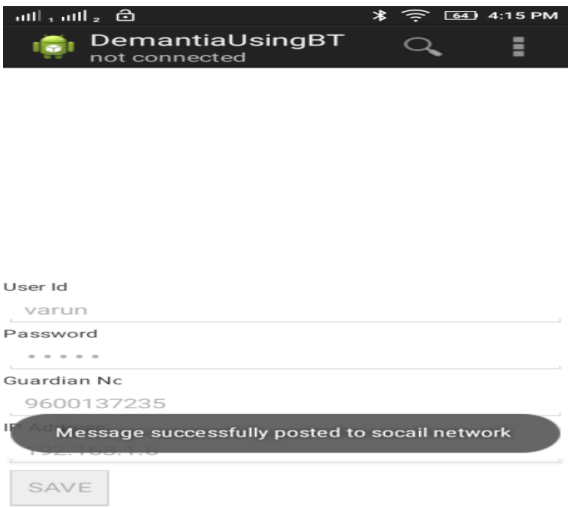
5.2 Embedded Hardware fabrication

In this module we use Bluetooth to communicate the various device. Bluetooth is a wireless technology standard for exchanging data over short distances from fixed and mobile devices, creating personal area networks(PANs) with high levels of security. It can connect several devices, overcoming problems of synchronization.



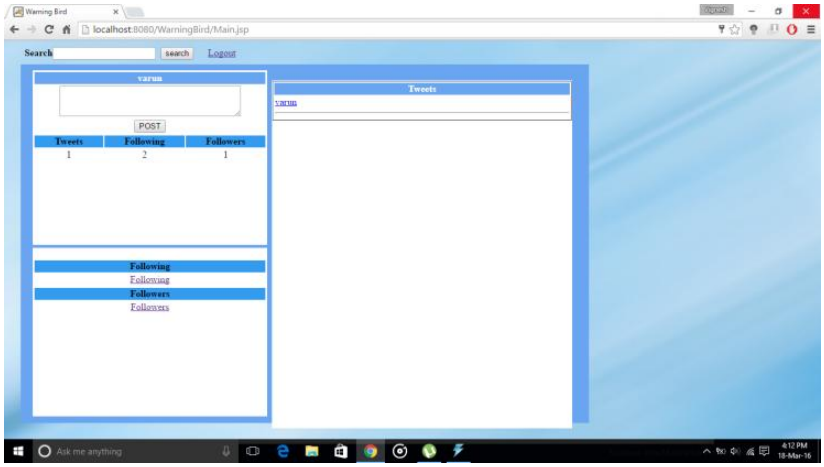
5.3 Bluetooth tracking –Automatic alert

In this module we integrate the Bluetooth to the android mobile ie when the patient is goes out of the range, an automatic alert is triggered.



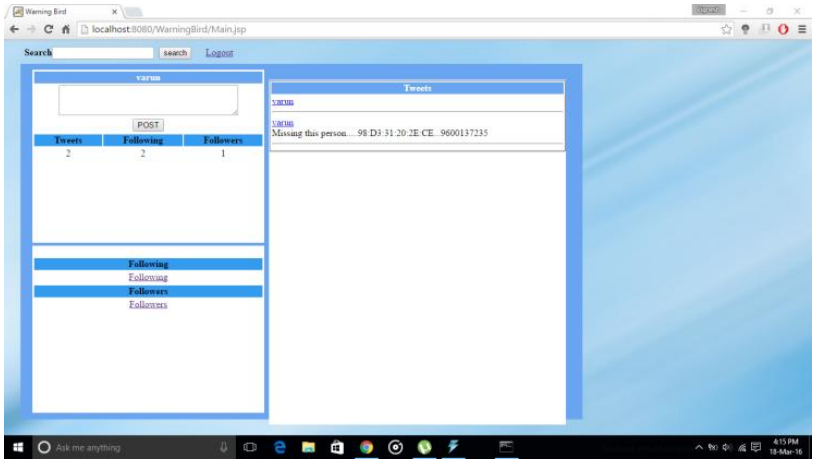
5.4 Cloud server

Cloud Data Service Provider will contain the large amount of data in their Data Storage. Also the Cloud Service provider will maintain the all the User information to authenticate the User when are login into their account. The User information will be stored in the Database of the Cloud Service Provider. Also the Data Server will redirect the User requested job to the Resource Assigning Module to process the User requested Job. The Request of all the Users will process by the Resource Assigning Module. To communicate with the Client and the with the other modules of the Network, the Data Server will establish connection between them. For this Purpose we are going to create an User Interface Frame. Also the Cloud Service Provider will send the User Job request to the Resource Assign Module in Fist In First Out (FIFO) manner.



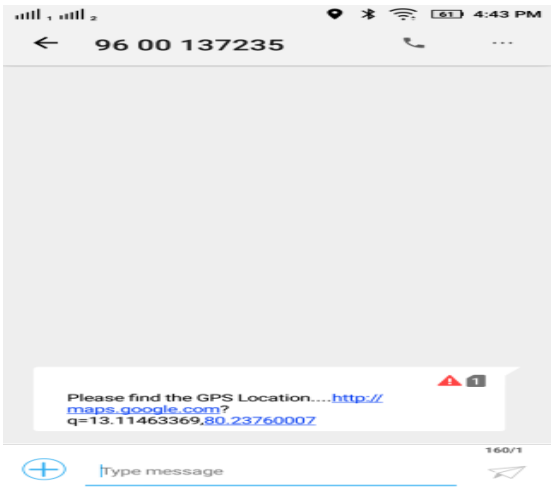
5.5 Bluetooth recognition Communication –Social network.

In this module we propose a Bluetooth recognition system that is ,if the patient goes our fo the range, blue tooth is connected with the patient will automatically pair with the other Bluetooth device in surrounding ,if the care taker broadcast the mobile number to the surrounding blue tooth user , if they are connected to the social network ,through the social network they can give location of patient to the care taker.



5.6 Automatic location notification

The blue tooth device connected with the patient will automatically pair with the any available Bluetooth device of any mobile phones so that automatically mobile number of the care taker is shared, so that person can communicate with the care taker about dementia patients current location.



VI Result and Discussion

We proposed a cloud based platform to show BLE tracking system for low price simple BLE tags. As the long term power saving and water proof packing, it is unnecessary to remove the tag in anytime. Patients and caregivers can be free from memorizing taking the tag every time. With help of smartphone, it can also make a more safe environment for dementia patients without great expenses of deploy a large scale infrastructure.

VI Conclusion

We proposed a cloud based platform to show BLE tracking system for low price simple BLE tags. As the long term power saving and water proof packing, it is unnecessary to remove the tag in anytime.Patients and caregivers can be free from memorizing taking the tag every time.With help of smartphone, it can also make a more safe environment for dementia patients without great expenses of deploy a large scale infrastructure.

VII. References

1. Chung-Chih Lin; Ming-Jang Chiu; Chun-Chieh Hsiao; Ren-Guey Lee; Yuh-Show Tsai, “Wireless Health Care Service System for Elderly With Dementia,” Information Technology in Biomedicine, IEEE Transactions on , vol.10, no.4, pp.696-704, Oct. 2006.

2. S.M.C. Rasquin, C. Willems, S. de Vlieger, R.P.J. Geers, M. Soede, "The Use of Technical Devices to Support Outdoor Mobility of Dementia Patients," Technology and Disability, vol.19, issue 2, pp113- 120, Jan, 2007.
3. SandeepKamath&JoakimLindh "Measuring Bluetooth® Low Energy Power Consumption" Texas Instruments, pp-18, 2012.
4. The Internet site on "https://build.phonegap.com/", Adobe Inc.
5. F. Bao, I. R. Chen, M. Chang, and J. H. Cho, "Hierarchical trust management for wireless sensor networks and its applications to trust-based routing and intrusion detection," IEEE Trans. Netw. Service Manage., vol. 9, no. 2, pp. 169–183, Jun. 2012.
6. F. B. Bastani, I. R. Chen, and T. W. Tsao, "Reliability of systems with fuzzy-failure criterion," in Proc. Annu. Rel. Maintainability Symp., Anaheim, CA, USA, Jan. 1994, pp. 442–448.
7. A. Carcano, A. Coletta, M. Guglielmi, M. Masera, I. Fovino, and A. Trombetta, "A multidimensional critical state analysis for detecting intrusions in SCADA systems," IEEE Trans. Ind. Inf., vol. 7, no. 2, pp. 179–186, May 2011.
8. A. C_ardenas, S. Amin, B. Sinopoli, A. Giani, A. Perrig, and S. Sastry, "Challenges for securing cyber physical systems," in Proc. 1st Workshop Cyber-Phys. Syst. Security DHS, 2009, pp. 1–4.

Corresponding Author:

E. Varun Kumar*,

Email: *vkvkvarun8@gmail.com*