ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

Android Based Child Tracking System

Rohit N. Bhoi, Dr. V. V Shete, S.B. Somani

Student, Department of E & TC, MIT College of Engineering, Pune, India

Professor & HOD, Department of E & TC, MIT College of Engineering, Pune, India

Assistant Professor, Department of E & TC, MIT College of Engineering, Pune, India

ABSTRACT: Day today crime against children is increasing at very high rate. So it is high time to offer security to children. This paper proposes a mobile based child tracking system that will help parent to keep observation on their child while seating in the office. The system consists of two module, child module and parent module.Child module which have GPS, GSM, and ARM7 and voice playback circuit and parent module which includes mobile phone (which supports internet connectivity) for getting the information about the missed child on periodical basis. Addition to the proposed system is that parents don't have to continuously monitor the location of child, if child is going outside of define area then alert message will be given to parents. Also if child is crying then also alert message will be send to parents. Child module have one panic switch, with the help of which child can alert parents if he is feeling insecure.

KEYWORDS: Child Tracking System, Global Positioning System (GPS), Global System for mobile communication (GSM), ARM7

I. INTRODUCTION

Today there is huge need of child tracking system as both the parent are working outside for their respective job, so no one is there to keep observation on their child and crime against children like kidnaping, harassment are increasing at very high rate. Child Tracking system will help the parents to track the moment of child.

In child tracking system geo-fencing is used to define particular area. The major advantage of geo-fencing is that, if child moved to defined area then alert message will be given to the parents. Because of this continuous monitoring of child moment is not necessarily required. Not only this, system will alert the parents if child is crying continuous. A panic switch is provided at child module with the help of which child can alert the parents that he/she needs help.

Children tracking system is also designed by Yuichiro MORI, [3] using autonomous Clustering technique. It consist of tags which collect the information of child group, each child is given one android terminal and server which stores tracking information. Tag consist of wireless LAN which construct a mesh network and also receives and transmit the information regarding to position of child from one tag to another and finally given to computer server which is located at school control room. This system will alert the school that one of the child is missing but its fails to tell where the child is at the current moment. Also it does not concentrate whether child is crying or not.

It is very difficult to place tag in different areas for a single school. City may consist of more than one school. There is also possibility that child may missed the android device, so it become difficult to implement Yuichiro MORI's child tracking system.

II. SURVEY OF DIFFERENT CHILD TRACKING SYSTEM

There are three main systems with the help of which child tracking system can be implemented. [2]

A. Cell Phone Tracking

The In cell phone tracking system every child is given one small cell phone with the help of which parents can call or message their child whenever they want, so they get detail information about the location and about the happiness of child. There is possibility that child may delete the call log and SMS details manually, for this all deleted data is saved

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

in server. Also content of message and call log can be viewed by their parents even if their child changes the number. This system also provides GPS location of the child so that parents can track the location of the child and can set up alerts if their child is moving outside of define area. This system can also track the browser activities and provides call block and message from specific number.

But this system is similar to carrying a cellular phone. Though today's generation is very well familiar with every mobile phone but children between edges of 4-8 may get problem with handling of cellular phone. Such children have huge tendency of playing, so they may missed cellular phone or they may not carry the cellular phone during play. In that case tracking of child activities will not be possible.

B. Android

In this system a particular android app is created and that will display child's location to the parents. Android is an operating system based on the Linux kernel, and designed primarily for touch screen mobile devices such as smart phones and tablet computers.

The proposed child tracking system uses this android based approach, to develop one android app that can show the location of child whenever parent's want and also alerts the parents if child is moving outside of define area.

C. GPS

The Global Positioning System (GPS) is space based navigation system that provides location information in terms of latitude and longitude, anywhere on the earth by using satellite. There are lots of application are of GPS which are mainly used in military, civil and in commercial purpose. In some of school of America, uses this GPS based system in which one small GPS module is placed in the bag of each child. But the problem with this is child may or may not carry the bag each and every time or bag is not necessarily with child every time.

The proposed child tracking system uses this GPS module as one of the function block which will track the location of the child and also alert the parents if child is moving outside of define area with the help of ARM7.

III. SYSTEM DESIGN

In The proposed block diagram for child tracking system is shown in figure

.

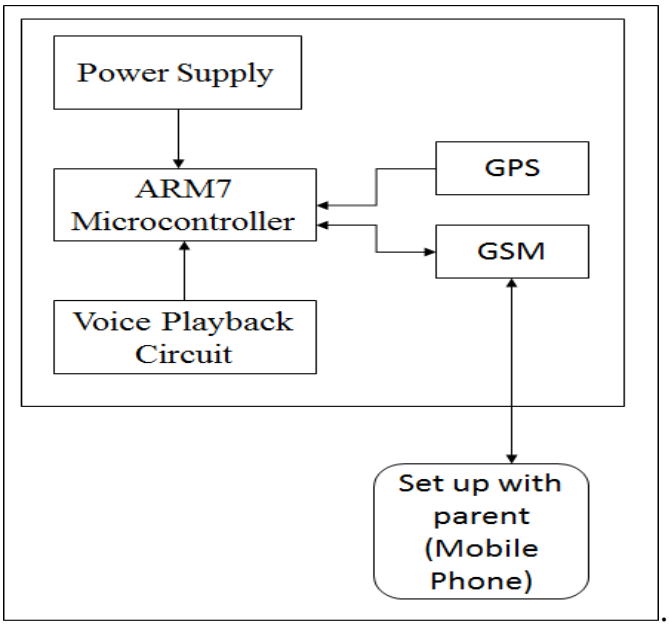

Figure 1: Block Diagram of the System

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

Basically there are two module, one is with child while other one is with parent. Module with child is consist of GSM, GPS, AR7, Voice Playback circuit, panic switch and associated power supply. There is Android Mobile phone which supports internet connectivity with the parent as second module.

With the help of geo-fencing particular area will be define for each child separately. GPS will continuously sense the current latitude and longitude values and will provide to the ARM7, ARM7 will continuously check whether child is inside of define area or outside. If child's location is found outside of define area then alert message will be sent to the parents. For parent module which is android phone an Android App is developed which will show the location of child. Whenever parent opens this android app one particular message will be sent to child module. System is designed in such way that child module will only reply to parents mobile only. The message coming from child module is consist of latitude and longitude value. Whenever app receives these latitude and longitude values it update the child location on map.

If child's location is found outside of define area then alert message will be given to parents, this alert message will be send to parent on periodical basis until child come back into define area or till system is shutdown. Because of this continuous monitoring of child will not be required. Even child is inside of define area and then also he want to see child's location then he can open the android app and see the child's current location.

As most of the voice recognition circuits failed to detect the crying of the child, a survey is done and noted that whenever child cries he/she starts with mummy word. Hence a short period of audio clip which consist of mummy word in Voice Playback circuit which will detect the crying of child. Now the hex value of this mummy word is taken in the code and each and every time this hex value is compared newly generated hex value from audio. If value matches then message will be send to the parent that child is crying.

IV. HARDWARE SYSTEM DESIGN

Hardware requirement is only at child module side which consist of GSM for sending and receiving message, GPS for location details, Voice playback circuit for detection of cry and ARM7 for controlling all.

A. *ARM7(LPC2138)*

LPC 2138 belongs to ARM7 (Advance Risc Machine) family. Clocking speed of ARM7 is very high and it have great interfacing features which will be required for GSM, GPS and voice playback circuit. The main advantage of using ARM7 is it needs low power for its functioning. The power factor at child module is most important, if power goes down it will result in system failure. ARM7 has the knowledge to give AT commands to initiate and send the child information message to Mobile phone through GSM module.

B. *GPS*

GPS is a multiple – satellite based radio positioning system in which each GPS satellite transmits data that allows user to precisely measure the distance from the selected satellite to his antenna and to compute position, velocity and time parameters to high degree of accuracy. GPS delivers with high sensitivity and accuracy with low power consumption. In this project main use of GPS module is to sense the current location of child. GPS module used for this project is GR-301, which provides latitude and longitude values.

Features of GPS:

- low power single chip High performance: -159dBm tracking sensitivity Low power:
- Backup battery support for faster position fix Blue LED for position fix indication IPX7
- Waterproof Built-in magnet
- Industrial operating temperature range: -40 ~ 85℃

C. *GSM*

The advantage of GSM is, its international roaming capability in over 100 countries, it have improved battery life, advanced features such as short messaging, Easy to use over air activation, and all account information is held in a

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

smart card, which can be moved from modem to modem. The GSM module used in this project is SIM300. The main used of GSM modem is to send and receive the message from child module to parent mobile.

D. *Voice Playback Circuit (easy VR):*

In this project voice play circuit used to detect the crying of child. For this easyVR voice playback circuit is used. First one short duration voice clip of crying of child is saved, which will be used as reference. Some of the features of easyVR are:

a) Non-volatile Flash memory technology.
b) No battery backup required.
c) 100K record cycles (typical)
d) Low power consumption
e) Automatic power-down feature for longer battery life.
f) Single 5V power supply.
g) User-friendly, easy-to-use operation.
h) Programming & development systems not required.
i) Level-activated recording & edge-activated playback switches.

V. SOFTWARE SYSTEM DESIGN

A. *Keil uVersion4 & flash magic*

Keil software is used to generate hex file which will be loaded in ARM7 (LPC 2138) by using flash magic. The code is written using 'C' language. Code is written for interfacing GPS, GSM and voice playback circuit with ARM7 at child module which is nothing but transmitter side. Code written in ARM7 in such way that it will generate appropriate output at receiver side. Flash Magic is used to burn the hex file into ARM7.

B. *Android Studio*

Android Studio is new software developed by 'Google' to generate android app. This software have much larger features about 'google map' related activities than ECLIPSE. Java language is basic platform for app creation. This app is only created for android mobiles.

VI. RESULTS& DISCUSSION

Figure 2 shows ARM7 (lpc 2138) development board. It receives the data from GPS module and sort it with required latitude and longitude values which are then forwards to GSM. It also operate easy VR for voice recognition.

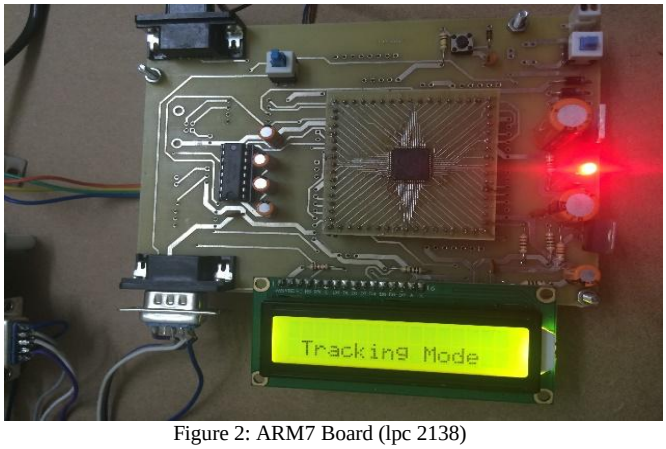

Figure 2: ARM7 Board (lpc 2138)

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

When power supply is given to GPS module (GR-301) it continuously sense current position and gives the data to ARM7.

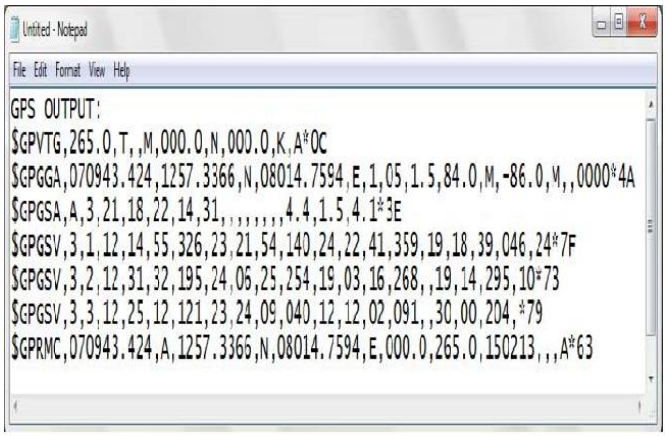

Figure 3: GPS Output

Main use of GSM modem is for communication with parents. GSM modem (SIM 900) receives the latitude and longitude values from the ARM7 send it to the parents mobile. It also send the message when child is crying.

Figure 5: Voice Play-Back Circuit

Voice playback circuit is used to track the crying of the child. Whenever child cries it will sense its crying and trigger the ARM7.Fig.7 shows the screen shot of the android application, which shows the child's location and parent's location.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

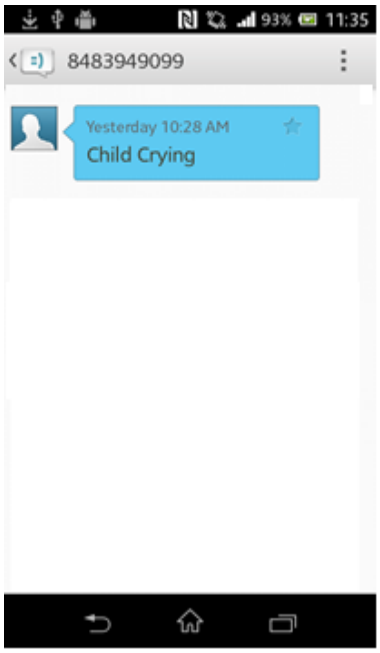

Figure 6: Output When Child Cries

Figure 7: Android Application

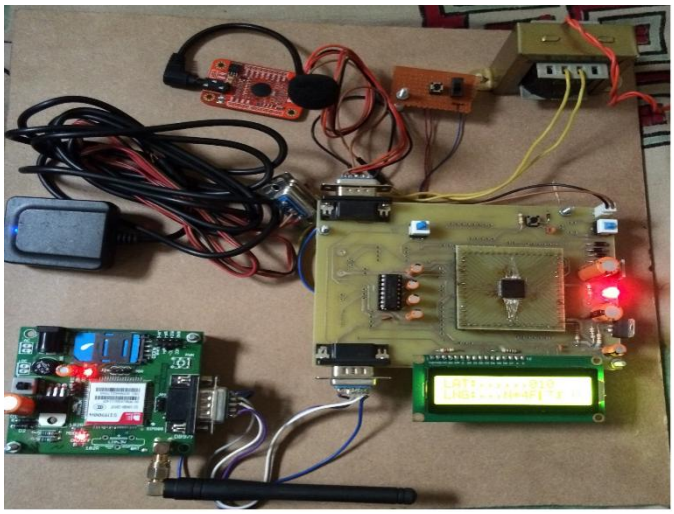

Figure 8: Total Transmitter Module

The Figure above indicates the full view of transmitter module.The following table shows the comparison of existing system and our system.

Parameters	**Existing System**	**Our System**
Geofencing	Not Available	Available
Panic Switch	Not Available	Available
Continuous Monitoring	Required	Not Required

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 7, July 2015

VII. CONCLUSION

The project implementation mainly concentrate on tracking of child's movement to and from school. A particular area can be defined for each child separately, so if child is moved outside of define area alert message will be given to parents. Also if child is crying in that case alert message will be sent to parents. The panic switch is provided at child module that can be used by child to alert his parents. Because of this parents will have a powerful tool to keep the observation on their child even when they can't physically see them.

REFERENCES

J.Saranya,J.Selvakumar,"Implementation of Children Tracking System on Android Mobile Terminals", International conference on Communication and Signal Processing, April 3-5, 2013, India.
[2] ReshmaM ,Sampreetha Ram N.S , Amrutha K.M , Terry Xaviour, "Survey On Different Technologies of Child Tracking System", IJCAT – International Journal of Computing and Technology Volume 1, Issue 1, February 2014.
[3] Yuichiro MORI, Hideharu KOJIMA, EitaroKOHNO,Shinji INOUE, Tomoyuki OHTA, and Yoshiaki KAKUDA, "A Self-Configurable New Generation Children Tracking System based on Mobile Ad HocNetworks Consisting of Android Mobile Terminals", proposed in 2011Tenth International symposium on Autonomous decentralized systems.
[4] Eitaro Kohno, TomoyukiOhta, Yoshiaki KAKUDA, Shinji Inoue and yusuke Akiyama, "Performance Improvement of Hiroshima city children tracking system by correction of wrong registrations on school routes Proc".
9th IEEE International Symposium on Autonomous Decentralized Systems (ISADS 2009), Athens, Greece, pp.261-265, 2009.
[5] Chao-Lin Chen; Kai-Ten Feng, Hybrid "Location Estimation and Tracking System for Mobile Devices", Vehicular Technology Conference, 2005. VTC 2005- Spring, 2005 IEEE 61st Volume4.
[6] A. Al-Mazloum, E. Omer, M. F. A. Abdullah, "GPS and SMS-Based Child Tracking System Using Smart Phone", World Academy of Science, Engineering and Technology International Journal of Electrical, Computer, Electronics and Communication Engineering Vol:7 No:2, 2013
[7] Dr/Ayman Mohamed Afifi, "Using of Tracking systems for devices designing to face children Kidnapping Phenomenon (GSM –GPRS -GPS)" International Journal of Scientific and Research Publications, Volume 3, Issue 10, October 2013 1 ISSN 2250-3153.
[8] Shatha K. Jawad, Al-Gawagzeh Mohammed Yousef, Balkiest Essa Al-Shagoor, "A Multipurpose Child Tracking System Design and Implementation", International Journal of Soft Computing ApplicationsISSN: 1453-2277 Issue 4 (2009), pp.57-68 © EuroJournals Publishing, Inc. 2009

BIOGRAPHY

Rohit N. Bhoi has completed his B.E. in Electronics & Telecommunication Engineering from FAMT, Ratnagiri, Maharashtra, India and currently pursuing his M.E in VLSI & Embedded System from MIT College of Engineering, Pune and completing project based on ARM7. His research interests include Embedded system design.

Dr. V.V Shete, Head, Department of E&TC, MITCOE Pune, affiliated to SavitribaiPhule Pune University. He has published numerous scientific papers in various domain. His area of interest are soft computing, Signal Processing, Communication.

Sunil B. Somanireceived the M.E. degree in Electronics and Telecommunication Engineering. He has been in the teaching field since last 22 years and specialized in areas such as Advance communication, Microwave engineering and Mobile communication. He is currently working as PG coordinator at MIT College of Engineering, Pune, India.