

Advance Child Tracking System By Using Arduino Nano

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Abstract- Today, Technology is growing rapidly and providing all essential and effective solutions for every requirement. Now a day's child security is an important area of concern. This model is developed to rectify the worries of parents regarding their child security. In this scenario, our system ensures maximum security and ensures live tracking for their kids because parent worries are genuine. This paper proposed a model for child safety through smart phones that provides the option to track the location of their children as well as in case of emergency children is able to send a quick message and its current location via Short Message services. This proposed system is validated by testing on the Android platform.

Keywords- Global Positioning System (GPS), Geo-fencing, Short messaging service (SMS), Child Tracking

I. INTRODUCTION

Today smart phones are the basic need of the user, these smart phones, providing lots of features which make our life so simple and easier. This paper is focused with the safety of children. Today child safety is an important issue across the world as child crime is rapidly growing across the world in this paper we have discussed how a smart phone provides safety and monitoring for the parents so that they can easily track their children according to their requirement. This proposed application is developed on android platform for this application the basic techniques required mentioned below:

1. Geo-Fencing
2. GPS (Global Positioning System)
3. SMS (Short Messaging Service)

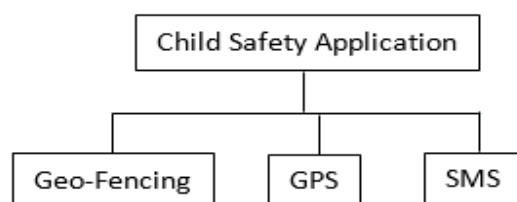


Fig.1. Contents of Application

II. LITERATURE SURVEY

“Performance Improvement of Hiroshima city children tracking system by correction of wrong registrations on school routes.” Which explains the system can provide group information of children on the way to and back from school. It is easy for parents to know their safety level. This paper explains technology for children tracking system based on mobile ad hoc networks. The field experiments using the children tracking system have been performed and the effectiveness of the system is shown by data analysis for the experimental results. [4]

“A Self-Configurable New Generation Children Tracking System based on Mobile Ad Hoc Networks consisting of Android Mobile Terminals.” which explains Autonomous Clustering technique” for managing groups of Android terminals attached to children in school. In this paper, they propose a new generation children tracking system which is based on experiences and findings of the field experiments for Hiroshima City Children Tracking System. Our proposed system consists of Android terminals which has Wireless LAN device and Bluetooth device with the ad hoc function. Our system manages groups of Android terminals using Autonomous Clustering technique. In this paper, we show the system requirements for our children tracking system and describe the implementation features to satisfy the system requirements. Finally, we provide some preliminary implemented results for our proposed system. [3]

“New safety support system for children on school routes using mobile ad hoc networks” For this paper, developed a new safety support system for children on school routes by using a mobile ad hoc network constructed from mobile phones with the Bluetooth function. The support system provided good performance and accuracy in maintaining the safety of students on the way to school [1]

GPS and SMS-Based Child Tracking System Using Smart Phone, they solved the problem by application GPS and SMS-Based Child Tracking System Using Smart Phone. Recently many cases of missing children between ages 14 and

17 years are reported. Parents always worry about the possibility of kidnapping of their children. This paper proposes an Android based solution to aid parents to track their children in real time. [7]

In "Mobile Tracking Application for Locating Friends", a tracking application software must be installed in the mobile phone and the friends must be previously registered in the friends group of application. To track their friends mobile phones are needed in both sides. [6]

“An Innovative Approach for Women and Children’s Security Based Location Tracking System”. In this System helps to Seek in any critical situation. For that, the system contains GPS to detect location and GSM mechanism to pass their current location to any one of trusted contacts as a google map link and services are provided to track the location.[5] In the present systems the solution for a parents their child safety but every technology has its limitations. Some present systems uses the mobile phone as a child module as well as parents module. In some systems when child is go out of the define area then systems can not able to intimate to the parents.

III. SYSTEM DESIGN

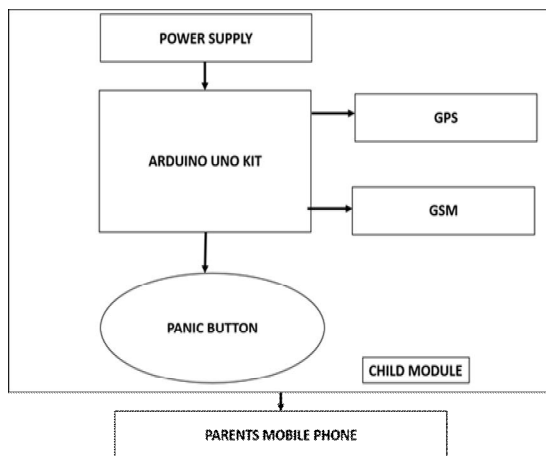


Fig 2: Block Diagram

A .BLOCK DIAGRAM DESCRIPTION

The block diagram for proposed Child Tracking system is shown above Presented here is a GPS based child tracking system based on the Arduino using global positioning system (GPS) and global system for mobile communication (GSM). The solution for tracking and a missing child is done with the help of GPS and GSM technologies. There are two main services are used for this application that is GPS and SMS.. Generally the selected operating system is android to over all the features. The application is user-friendly on both

sides. This system is based on client-server architecture. Parent side acts as server and child side acts as a client .The system can be mounted over a device in a hidden or suitable compartment. After this installation, you can easily track your child using your mobile phone by dialing the mobile number of the SIM attached to the GSM modem. You will automatically get the location of the child position in the form of an SMS (short message service) on your mobile phone.

IV. HARDWARE SYSTEM DESIGN

A. Arduino

In the proposed system Arduinio Nano is used. It has similar functionality to the Arduino Uno, but in a DIP module package and works with a Mini-B USB cable. The Mini-B USB cable is included. In Arduino Nano Board Microcontroller AT Mega 328 is used .It has 8 Analog input pins and 14 Digital I/O pins. Flash Memory is 32 KB out of which 2 KB used by bootloader. It has Operating voltage is 5v. Its clock speed is 16 MHZ.

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 high sensitivity and accuracy with low power consumption.

C. GSM

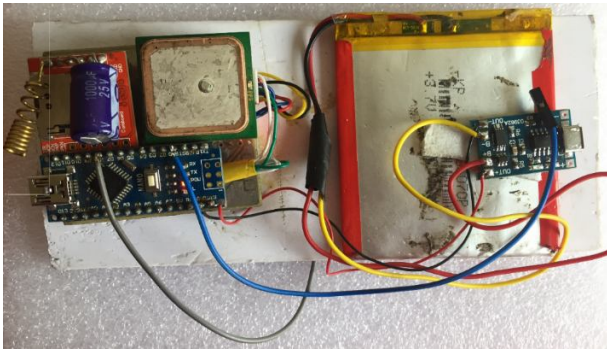
The Advantage of GSM is, its international roaming capability in over 100 countries, improved battery life, efficient network design for less expensive system expansion, efficient use of spectrum, advanced features such as short messaging and caller ID, a wide variety of handsets and accessories, high stability mobile fax and data up to 9600 baud, Easy to use over air activation, and all account information is held in a smart card.

D. Voice Playback Circuit

Voice Playback circuit has following Features:

Single Chip, High Quality Voice recording and playback solution. It has non - volatile flash memory technology and no battery backup is required it has 4-8 KHz adjustable sampling rate can be done. It has Audio output to drive a speaker or audio out for public address system.

V. EXPERIMENTAL SETUP



This project proposes a system which is helpful in monitoring or tracking the child. This project uses only one GPS device and two-way communication is achieved using a GSM modem. GSM modem with a SIM card used here implements the same communication technique as in a regular cellphone .The system can be mounted over a device in a hidden or suitable compartment. After this installation, you can easily track your child using your mobile phone by dialing the mobile number of the SIM attached to the GSM modem. You will automatically get the location of the child.

VI. RESULTS

APPLICATION DETAILS:

STEP 1

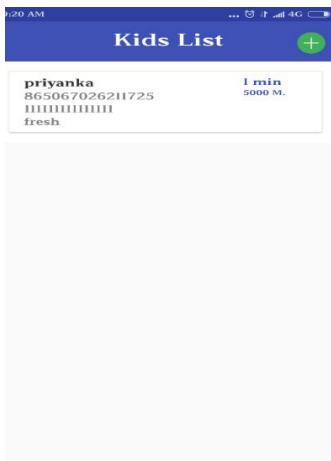


Fig 4.2: List of kids

STEP 2

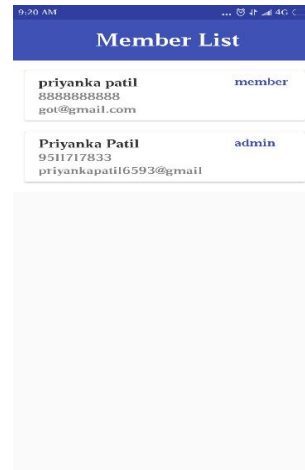


Fig 4.3 Members list

STEP 3 :

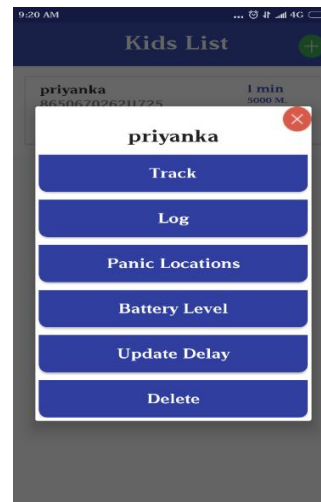


Figure 4.4: Different options of mobile App

STEP 4 :

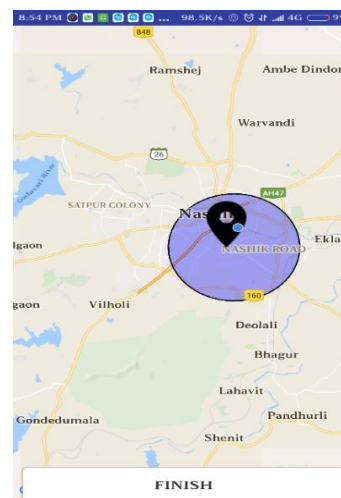


Figure 4.5: Geo-fencing

STEP 5:

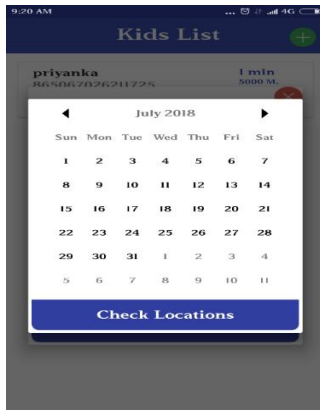


Figure 4.6: Log information

STEP 6:

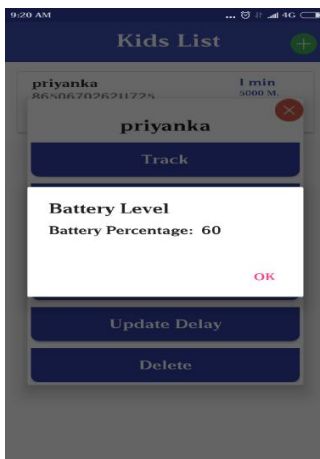


Figure 4.7: Battery level

STEP 7:

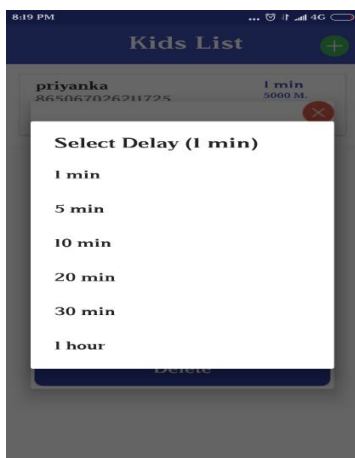


Figure 4.8: Update Delay

APPLICATION STEP DECSRIPTION:

Step 1 shows about the mobile app that will be with parents. In this window we can add the details of child, parents can add as many children as they want. Here the International Mobile Equipment Identity (IMEI) number of the tracking device is displayed.

Step 2 shows the member list .we can add the multiple members.

Step 3 shows various options such as track, log, panic locations, battery life and update delay.

Track: we can track the exact location of the device.

Step 4 shows defind geo-fencing area. We can vary this geo-fencing area from 500 m to 10 km.

If child go out or in geo-fencing this alert is send to the parents and they can track the location of the child.

Step 5 Log: In Log option, we get the all related previous information of the device according to the date as well. Here parents also gets privilege to check the previous location of the child. Parents can check according to the year, month of the year, days of week as well as dates panic location also gives us the information about the panic button pressed previously in the same way. If parents wants to check when and where the button was pressed, it gives the details in same way.

Step 6 Battery life : It tells us about the device’s battery life or level of battery. It displays about the child’s device battery life on parents app. Here we can notice that it is 60 percent.

Step 7 Update Delay: It updates the location delay can be according to the parents’ choice. As parents get the continuous information of the child’s location on the app. By using this option parents can set a specific delay time for the location update. Here we can set delay of tie period such as 1 min, 5 mins,10 mins, 20 mins, 30 mins and 1 hour as well. According to the set time period parents will get the update information.

VII. CONCLUSION

In conclusion, this application is designed for locating missing children. The solution represented in this paper takes the advantages of smart phones which offers rich features like Google maps, GPS, SMS etc. Some of the best works implemented in past relies on SMS based tracking which is not helpful to get an accurate location in our proposed system we have provided real time tracking. We

have added Geo-fencing and Emergency messaging services to enhance the system.

REFERENCES

- [1] Atsushi Ito, Yoshiaki Kakuda, Tomoyuki Ohta and Shinji Inoue, "New safety support system for children on school routes using mobile ad hoc networks", *IEICE Transactions on Communications*, vol.E94-B, no.1
- [2] J.Saranya ,J .Selvakumar :”Implementation of Children Tracking System on Android Mobile Terminals,” *International conference on Communication and Signal Processing*, IEEE, 2013, India.
- [3] Yuichiro MORI, Hideharu KOJIMA, Eitaro KOHNO, Shinji INOUE, Tomoyuki OHTA, and Yoshiaki KAKUDA, “A Self-Configurable New Generation Children Tracking System based on Mobile Ad Hoc Networks Consisting of Android Mobile Terminals”, *proposed in 2011 IEEE Tenth International symposium on Autonomous decentralized systems*, 2011.
- [4] Eitaro Kohno, Tomoyu ki Ohta, 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] Dr.Velayutham .R , Sabari .M, Sorna Rajeswari .M. “ An Innovative Approach for Women and Children’s Security Based Location Tracking System” *IEEE International Conference on Circuit, Power, Computing, Technology*, 2016.
- [6] Ghaith Bader Al-Suwaidi, Mohamed Jamal Zemerly, “Locating friends and family using mobile phones with global positioning system (GPS),” *IEEE/ACS International Conference on Computer Systems and Applications*, 2009.
- [7] A. Al-Mazloun, E. Omer, M. F. A. Abdullah, GPS and SMS-Based Child Tracking System Using Smart Phone, *International Journal of Electrical, Computer, Energetic, Electronic and Communication Engineering Vol:7, No:2*, 2013