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Child monitoring system using IoT

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ABSTRACT

In our nation, children are the most precious resources as they are imminent of the country. The parents always look forward to having their children in a safeguarded place where they can make their time without any complication. Unluckily children are threatened. The violation has been growing increasingly. The security of graduate school going youngster is a noteworthy constituent motivated to proceed along with the assist of innovative advancement. During children transit to and from the school, there are many miserable cases observed in media. In our nation, due to the absence of preventative considerations children seems to be nowhere to be found and later end up in the trouble. During the transit of the children to and from school, parents are anxious. Therefore, in current days, the security issue of school children is to be given supreme significance. The objective behind the project is to design a child safety system through smartphones that provide the possibility to trace child's location as well as during emergency children can alert parents by saying a child is in an emergency via message. An Android application is developed and installed on parents phone so that their children can be traced, monitored to keep track of their activities and location using GPS. The system is developed using P89V51RD2 microcontroller, GSM, GPS and a panic (alert) button along the RF transmitter and receiver.

Keywords— Child monitoring, IoT, Child tracking

1. INTRODUCTION

On the digital world where the mechanization reaches kids hands, parents may worry about the consequence of this broad world on their children growth. They may worry about the damaging effect of this mechanization on their educational, emotional and social development. To overcome some of these worries, a parent may need to have some controlling mechanization for their children to check and track their usage for the devices [1].

This primary aspiration of every parent across the worlds is feeling satisfied and safe about their children is the ultimate contentment. In spite of the fact that we rarely find a replacement in case of taking good care of the children requires the persistent monitor mechanism to be used, we observe that in real life and in actuality the continual monitor mechanism of a child is not easily and effectively achievable. Children always give the best pleasure mixed with the satisfaction of love, care, emotions, pain, happiness and contentment of fullest during the period of their growth [2].

There are drastically increased crimes against the child in recent days and it's been increasing everywhere and all around the world which calls for the rapid increase in the greater estimate and it is a necessity for the mechanization to be made for children who are the future citizens for our country. Never the less, there is any weighty mechanizations for the current children to protect against the threats and dangerous attacks by the outsides which leads to the affirmation for the child safety and security to the ultimatum [3]. This paper is especially focused on children's movements from home to the school entrance, trying to solve a little part of the school-age children's security problem by providing the children with school belt with tracking facility, tapping facility when they are in danger.

In current days, researchers and publishers are made use of the term internet of things is make reference for the basic impression in a profitable way, particularly when everyday substances is being legible, understandable, detectable, analyzable, available and preventable through the internet, RF module mechanization, write not used for local area network and mechanizations and wide area network and other mechanizations [4].

Combining various developments will help to build an Internet of Things authorize interaction of brilliant based systems with the real world scenarios. Depending on IoT, RFID mechanisms,

and cloud computing mechanizations, our project is designed in such a way that guarantees the children safety to fullest and security protection is achieved without any failures, focusing mainly on the security aspects for the school routes of the child built a system that uses such type of data to alert parents immediately when their child is moving through school bus to the school and back home [5]. The system designees alert facility, manifested by a backend operating system, when the child enters the school and exits the school [6].

Child safety mechanization examines mainly used arguments used to formalize within between the two age group and it also implements Fuzzy bin based classification mechanizations used for representing Bin-Boundary's by making use of fuzzy based mechanizations.

2. LITERATURE SURVEY

Mori et al put forward the child tracking system that uses mobile ad hoc networks which will provide particulars in a group of children. Using android terminals he presented a child tracking system, in that Bluetooth technology, was used to entitle communication among android terminals and configure a Bluetooth MANET. This system uses autonomous clustering technique that can be used to superintend group of Android terminals, but the problem with this system is, if the child loses the mobile it will not be possible to track the child [7].

Cassandra Dsouza, Dhanashree Rana, Anjanette Raj, Supriya Murkar, and Namita Agarwal related to Child Security System. The project will be developed using a GPS sensor, GSM module, Microcontroller, and a Panic button along with an RFID tag and Reader. It is anticipated that this project boosts confidence in children. A panic button which sends an alert message to a parent when their child is in danger [8].

Al Suwaidi, Zemerly put forward an android application using GPS, client-server approach to provide location information of family. This system also vigilant user when a companion is nearby [9].

Laxmi Priya describes the model of the child monitoring system is executed which gives the information about the current child position to the parents by using google application, the location can be checked from anywhere through android application. The child monitoring system which is used successfully by Reducing the size of the child module and combining it to the identity card of the child[10].

Aditi Gupta describes this android application is planned for tracking the missing children. this paper extracts the advantage of the android phone which provides affluent attribute like SMS, GPS, google maps. Here the Geofencing is also added and exigency SMS service to increase the system [11].

Fahmi, Baihaqi Siregar, Sylvia Evelyn and Dani Gunawan are described GSM shield, GPS module appeal for child safety. A locator structure that utilizes GSM shield, GPS module and Adriano can give a solution for monitoring children. User can explain a location in real time and focus on utilizing Google maps [12].

3. HARDWARE MODULES USED

Microcontroller (P89U51RD2) is used in our hardware component is being used for determining of the Radio Frequency Identification module making use of Global System Monitoring module, Sound tracker using the Global

Positioning System along with the Radio Frequency Transmitter along with the Radio Frequency Receiver.

3.1 P89V51RD2 Microcontroller

Heart of the hardware is making use of the Microcontroller as a primary source. 8051 Philips P89V51RD2 Microcontroller is suitable for this kind of microcontroller. In this paper, 64kB flash and making use of the P89V51RD2 microcontroller along with 1024B random access memory is been used for data. The primary element of this microcontroller uses the X2 mode option. In microcontroller P89V51RD2 there are some different ports and each port are using to connect for different devices such as LCD Display, GSM module, GPS sensor and RF Transmitter and RF Receiver. Microcontroller P89V5RD2 is low power and high performance.

Features:

- It is a series of 8051 8-bit Microcontroller.
- It consists of a 14pin IC.
- There are 4 8-bit Input/Output Ports.
- It consists of 3 16-bit Timers and Counters.
- Temperature range is -42 to 85 degree Celsius.
- RAM is 1KB and ROM is 64KB.
- It supports UART and SPI Protocol.
- Operating Voltage 5V.
- Oscillating frequency 11.0592MHZ.
- It consists of 8-bit interrupt sources.
- It supports 12 or 6 clocks per machine cycle.
- Temperature range is -42 to 85 degree Celsius.
- second DPTR register is used with other mechanisms.
- Lower EMI mode is used and is imbibed.
- Logical levels of the TTL and CMOS are high.
- Detection with brownout is very accurate.
- Lower powers are implemented very quickly.
- Wake up and the power down mode using the external interrupts can be very fast.
- Idle mode is implemented.

3.2 Sensor with GPS

GPS is useful for tracking purposes and in the project we use it for tracking the children. It also provides the accurate data, about where their child is currently located along with it also update the parents of the child about their current latitude and longitude locations and parents can know how far their children are located. Short Message Service mechanizations are being used by the Android mobile phones when it does not be accessible for Internet services and the child has to send the message or alert to their parents by making use of the SMS services to give the exact location of the child to their parents accurately. This type of systems provides a strong security mechanizations to assist the parents for tracking the locations of their child and also assist the parents to track their child without being known to the child because their movement is showcased on the parent android smartphones or other types of devices via google maps and to gain the calculated distance being used for their children within minutes

3.3 GSM (Global System for Mobile Communication)

The most prominent excellence for mobile phones makes use of the Global System for Mobile Communications in this big world. In this approach, the vibration sensor is placed in the child belt to find the children location accurately. When an emergency incident or situation occurs, the school management

system, the child's parents or the guardians will fetch the current locations of the child by means of GPS tracking facility immediately which helps the parents to get the information efficiently.

3.4 RF Transmitter

The RF Transmitter is used as a platform for both the control unit and in the robotic module mechanism. In this project, we implement RF Transmitter which is placed in the Parent module and it is connected with panic button option and by using RF Transmitter parents can send a request for children location accurately and effectively without any disruptions.

3.5 RF Receiver

The RF receiver module receives the distance information's that is communicated by the robotic module. The receiver in the robotic module gathers the control signals communicated by the control unit which are then used for controlling various functionalities of the robot.

4. METHODOLOGY

The proposed system focus on developing a child monitoring system from which we can collect the location of the child providing us with the location tracking facilities, photo capturing mechanisms, auto compliant for the nearby police stations along with a message to the nearby hospitals in an emergency. Thus enhancing the safety and security of the children efficiently and accurately. This concept also helps to avoid many threats, dangerous problems that are harmful to children's. The system architecture consists of a smartphone with GPS, GSM, GPRS, G-MAPS CLOUD, MMI, ACCELEROMETER, CAMERA modules to provide tracking, photo capturing and location monitoring facilities along with RF transmitter that is fixed in the school and whenever the child enters the school the RF transmitter will sense the child and sends the alert message to their respected parents and receiver in cooperated in the child's sensor medium to respond accordingly.

We implement the sensor in the belt of the school children and the children are trained and given knowledge about its usage to use it when in danger and in emergency situations.

The parents can automatically fetch the location of the child's via message. They can even request for the photo capture of the child's atmosphere. The location consists of latitude and longitude coordinates, the latitude coordinates before the longitude coordinates are listed. Once the parent fetches the child location, it automatically gets plotted on GMAP. Using the location fetched, copy the latitude and longitude coordinates and paste them in the android application. Then parents can find the nearby police stations, hospitals, alert the nearby police station by registering compliant these features are supported using MMI (Make My India). All of these activities are carried out through android application installed on parents' phone. The messages are transmitted using GSM.

The architecture of the system with improved safety and security mechanizations is shown in the figure 1.

The solution is achieved by using GPS and GSM mechanizations for tracking the children. There are two main services mechanizations that can be used for these applications is that they make use of the GPS and SMS mechanizations. To fetch the location services we implement GPS mechanizations and for the telephony services we implement SMS mechanizations

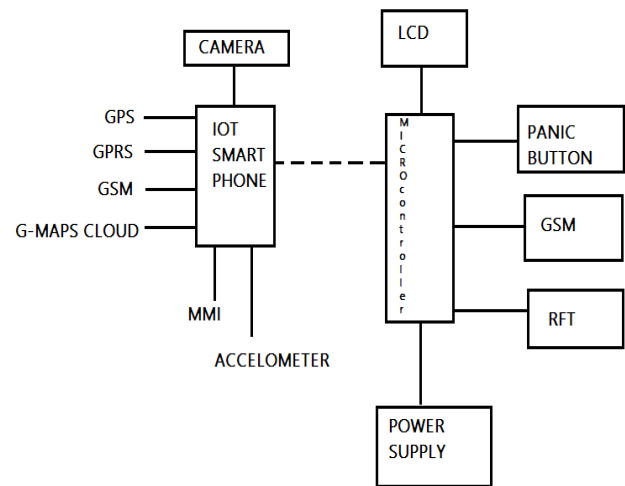


Fig. 1: Working of the proposed system



We implement android for overall operating system functionality. The communication makes use of SMS Services within Child module and Parent module. The application is based on both sides as a user-friendly approach. Java support and eclipse android IDE can be used as the primary sources to our project. The architecture of this application is shown in the diagram below which makes use of client-server Architecture mechanizations. We implement two modules in our project which is the main head and tail of the project which is Parent module and Child module. Parent module function as the Server side operating medium and Child module function as a Client-side operating medium. We manifest to be using two Android mobile phones in our project in which one acts like a child module and another act as a parent module.

The proposed work aims to develop an IoT application that helps in tracking the children when in danger and ultimatum by making use of the GPS, GSM mechanizations implemented in the school belt of the children. This belt has an integrated feature of Auto Photo Capture Activity and sending that to the parent's Emails. The complaint can be raised to the nearby police station about the child when being kidnapped. In addition to the usage of location tracking facility in the proposed system our project also provides the security with the highest accuracy and safety to overall systems being used. So these facilities help in the safety commutation of the school children so that minimizing the ratio of crime and threats happening everywhere.

5. CONCLUSION

This paper presents when the child enters the school parents receive the message that the child entered the school. When the child is in danger parents the longitude and latitude details via SMS. They can even track the exact locations of the child by knowing the latitude and longitude data collected and parent can register the complaint to the surrounding nearby place

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