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Enhanced security, tracking & monitoring system for school children

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ABSTRACT

Now-a-days children are facing many security related problems. In such a situations, they are helpless and don't have any way to inform it to family members or police. Hence there should be a system to protect them. So this system helps them to seek help in any situation. For that the system contains GPS to detect location and services are provided to track the locations from that moment onwards to save the person.

Keywords: Alerting system, Global Positioning System (GPS), server, school children, Adriano Uno, SOS switch.

INTRODUCTION

Child safety is the protection of children from violence, exploitation, abuse and neglect. Child protection system is a set of usually government-run services designed to protect children and young people who are underage and to encourage family stability. Many cases of missing children are reported. It is used to safe the children from every situations. GPS module is used for tracking the current location of children. This system mainly focused on tracking and monitoring the children for every situation. If the child location is changed or when child press SOS switch immediately sending alert message to the parents mobile. This is done by using server, in which server is tracking live location and sending the message to parents mobile whose child is apart from the area. Hence this system combines both GPS and server technology to provide a hand in such situations. The working model for this system is developed and tested periodically for constant monitoring.

EXISTING SYSTEM

In Existing systems, different tracking techniques and external devices are used to monitor the students. Some of the devices are camera, remote access for doorways, metal detector, videotaping, scan cards, and ID cards are used based on RFID.

It is difficult to access the devices especially for school children because RFID tag may be missed by kids. But only proposed system can get the location of the conveyance.

SECURITY TRACKING AND MONITORING

In today's world, ensuring safety and security is a major concern and top priority. They have been numerous reports of mishaps with children on their way to home. Numerous approaches to monitoring and alerting system have been proposed so far. Wireless sensor network used for monitoring time system which is working on the GPS and GPRS technology which provide the location of the

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children. Tracking is a very important shared resource that enabling efficient and effective use of resources like GPRS and GPS unit that can be installed and used to track its location. Database and

server process the data collected from the hardware module and feed the required pre-computed data to the user interface layout.[1]

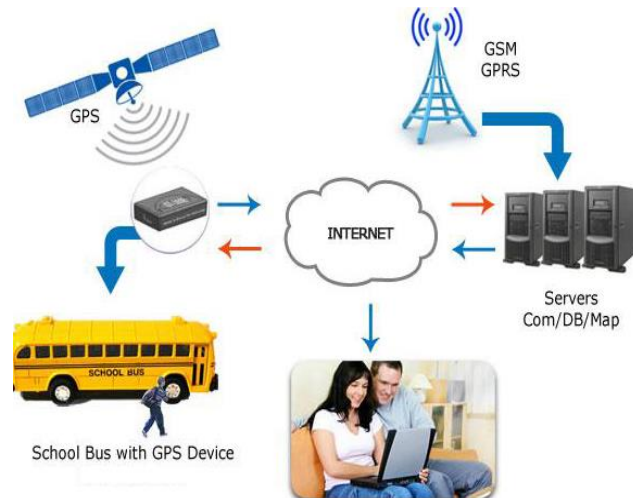


Figure3.1. Monitoring System

PROPOSED SYSTEM

The proposed methodology adopted in the present project work is depicted in the Fig.4. 1 shown below with various blocks as follows. [2]

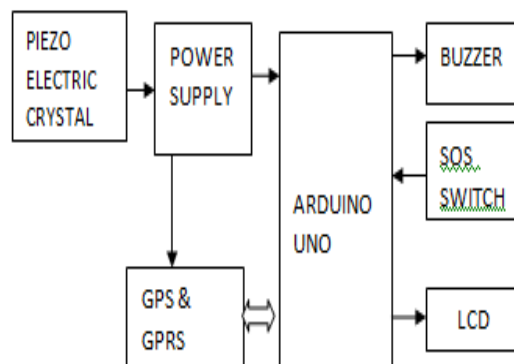


Figure4.1. Block Diagram

This project describes about tracking & monitoring the children using GPS & Server. Now a day's many children are kidnapped in the society. It helps to identify the current location using GPS.

SYSTEM ARCHITECTURE

GPS

GPS modules are popularly used for navigation, positioning, time and other purposes.

Tracking & monitoring the live location using server. If the child location is diverted, immediately information sends to the parent.

GPS antenna receives the location values from the satellites. GPS has become a widely used aid to navigation worldwide, and a useful tool for map-making, land surveying, commerce, scientific uses and hobbies such as geocaching. GPS receiver

measures the transmit time of each message and computes the distance to each satellite. Geometric trilateration is used to combine these distances with the location of the satellites to determine the receiver location. The position is displayed; perhaps with a moving map display or latitude and longitude, elevation information may be included. Many GPS units also show derived information such as direction and speed, calculated from position changes. Current GPS consists of three major segments. These are the space segment, a control segment, and a user segment GPS gives information about:[3]

- 1) Message transmission time
- 2) Position at that time

GPRS

General Packet Radio service is packet-based wireless communication service which provides data rates ranging from 56 to 114kbps. The key elements of GPRS technology is that it uses packet switched data technique instead of circuit switching, and this technique makes much more efficient use of the available capacity. GPRS modem is used for transmitting and receiving the data. SIM 300 is a tri- band GSM/GPRS engine. It operates on one or more frequencies out of frequency bands which support the radio 850, 900, 1800, 900MHZ. [4]

BUZZER

A Buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound.

16x2 LCD

A 16x2 LCD is used for displaying location values. A 9v battery is used to power up the circuit. These modules are preferred over seven segments and other multi segment LEDs.

It can display 16 characters per line and there are two such lines.

MONITORING UNIT

The monitoring unit consists of a GPS/GPRS and a Web Application. The GPS/GPRS will acquire the position of the children (longitude and latitude) and then by typing those co-ordinates in web application owner of children can get the exact location of the children.

ARDUINO UNO

The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. Simply connect it to a computer with a USB cable are power it with a AC-to-DC adapter or battery to get started. It communicates using the original STK500 protocol.

SOS SWITCH

SOS remained the maritime radio distress signal until 1999, when it was replaced by the Global Maritime Distress and Safety System. SOS is still recognized as a standard distress signal that may be used with any signaling method.

PIEZOELECTRIC CRYSTAL

Piezoelectricity is the electric charge that accumulates in certain solid materials such as crystals, certain ceramics and biological matter such as bone, DNA and various proteins in response to applied mechanical stress. Piezoelectric sensor interfacing with Arduino. It is used to measure the changes in parameter like pressure, temperature, acceleration and force, by converting them into electrical charge. This sensor works on principle of the piezoelectric effect.[5]

IMPLEMENTATION DETAILS

The GPS location of the conveyance is perpetually tracked by the satellite and data is sent from GPS to server. Authorized user can get location of data in the mobile application from the

server. Accelerometer sensor is utilized to detect the displacement of the conveyance, and if any intrusion in x, y or z axis and immediately alerting message will be sent from microcontroller to user's mobile. When SOS switch is pressed, the GPS transceiver/modem communicates with the satellites and then finds latitude and longitude information using circulation method. Then the GPS modem communicates with server and stores the data about location in small sized memory of Arduino UNO.

RESULTS AND ANALYSIS

It represents the positions of the children at the various places under that location range. If any

student entry at particular location is not detected the absent status is send as an SMS to the concurrent parent. When the SOS switch is pressed, the GPS transceiver/modem communicates with the satellites and then finds latitude and longitude information using circulation method.

Disadvantages

We can only track the child within the required range. If the child who reaches out of the range, we can't track that specified children. If the memory space allocation is small, we can't store the data up to date about the child's location.

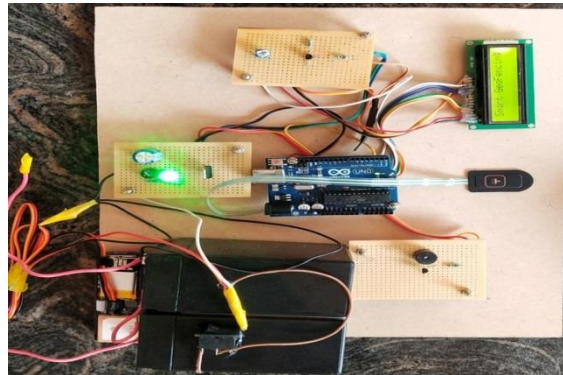


Figure7.1. Results And Analysis

INFORMATION SENDING SYSTEM

If the device will be on, immediately alarm ON message was displayed. If child press the SOS switch in critical situation, emergency alert send to the parents. At the time 0050000 particular distance

was set to the child location using server. If the location will be situated then "SET OK" message will be displayed. And finally view the child's current location using circular method .If the child location clearly displayed in the Google map. [6]

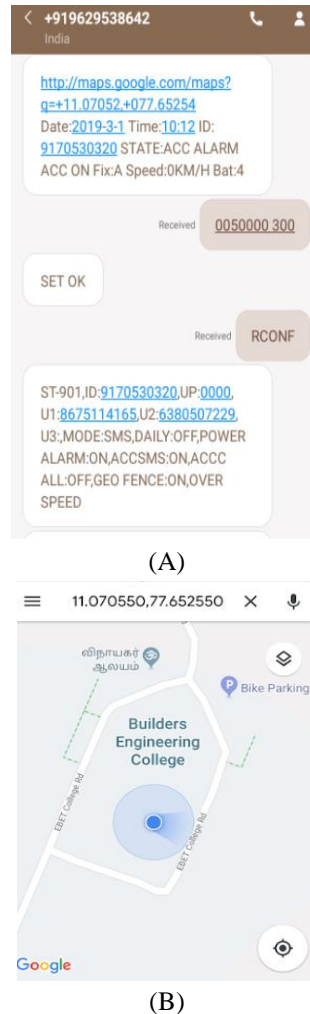


Figure 8.1(A) and (B) Information Sending System For Google Map

CONCLUSION

In this system, when child press the SOS switch emergency alert message will be send on the parents mobile. GPS is used to identify the current location of the children. Server is tracking the live location & sending the message to parents mobile apart from the area. GPS is used to find out the latitude, longitude information from the

triangulation or circulation method. This project is used to track the school students whether they are inside the school during school timing or not. In future this proposed methodology is enhanced with anti-collision mechanism and biometric system is to be proposed to replace with the existing RFID technology.

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