

Child Tracking System Based on GSM

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ABSTRACT: Recently many cases of missing children between 14 and 17 years are reported and a higher possibility of the kidnappers. Our aim is to focus on these cases where the children are kidnapped. This project includes a geo fencing campus, a child module and a parent module. The geo fencing campus is to find the location and to track the child movements. Once the child is out of the campus a message will be sent from the child module to the parent module which alerts the receiver. We have also introduced a sensor to detect the child emotions. And mostly concentrated on when the child cries. A microcontroller ATMEGA 162 is used with a Global system for mobile communication and Global positioning system module. This helps one to track and find the child movements.

KEYWORDS: ATMEGA 162, GPS, GSM module, child module, parent module

I.INTRODUCTION

Children tracking system is widely used all over the world to assure parents that their wards are safe from suspicious actions and their kid is happy in school atmosphere without crying. The proposed system includes tracking the child's movement to and from school. The information pertaining to missed Child is sent to their parent's mobile number, if they move beyond the school boundary. Not only the information about the child's whereabouts but also whether the child is crying is sent to parents through text message to their Android mobile services.

Android terminals have wireless LAN and Bluetooth device. It adopts Bluetooth Communication among Android mobile terminals in every cluster to collect information and cluster head delivers the same through tags to server using wireless LAN. It results in lack of individual & also does not concentrate on child crying. It offers less security. Children tracking system is also developed based on mobile adhoc networks. System development says that in GPS system and tag based system, each parent cannot obtain group information on the vicinity of the child. Through field experiments, it is confirmed that, as long as children walked at normal speed on the predetermined way to and back school, the system could provide location and group information of children to their parents.

II .SYSTEM DESIGN

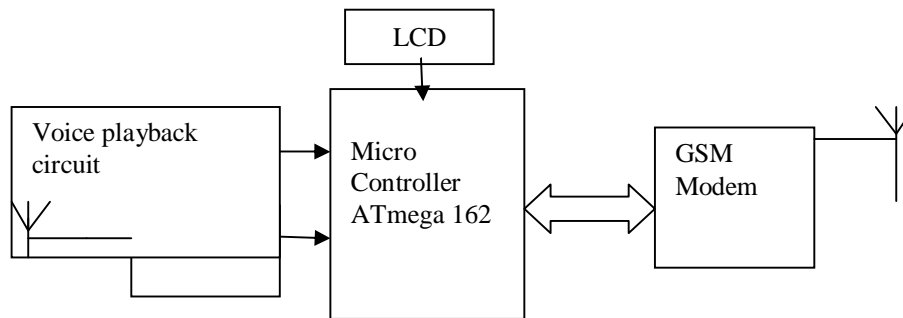


Fig 1. Block Diagram of proposed system.

This section describes the conceptual design of a Children Tracking System (fig.1). The children information is transmitted and received using GSM technology. The child module acts as a transmitter which includes ATmega 162v microcontroller, GSM module, GPS module and voice playback circuit. The receiver module includes Android phones. Child module is fixed to each and every child. The position of the moving child is tracked by GPS and is sent to ATmega 162v microcontroller. This controller forwards the GPS data (latitude and longitude) to GSM board. When the child cries, voice playback circuit is triggered by ATmega 162v microcontroller and intimation about corresponding child is given through text message to their parents.

III. HARDWARE SYSTEM

- ATMEGA

The ATmega 162 is a low power CMOS 8 bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega 162 achieves throughputs approaching 1mps per MHz allowing the system designed to optimize power consumption versus processing speed.

- GSM

This is a plug and play GSM modem with a simple to interface serial interface. Use it to send SMS, make and receive calls and do other GSM operations by controller it through it through simple AT commands from micro controllers and computers. It uses the highly popular SIM300 module for all its operations. It comes with a standard RS232 interface which can be used to easily interface the modem to micro controllers and computers. The modem consists of all the required external circuitry required to start experimenting with the SIM300 module like the power regulation, external antenna, SIM Holder, etc.

- Carbon Mic Working

The carbon microphone also known as carbons button microphone (or sometimes just a button microphone) or a carbon transmitter, is a sound-to-electrical signal transducer consisting of two metal plate separated by granules of carbon. One plate faces outward and acts as a diaphragm .When sound waves strike this plate, the pressure on the granules changes, which in turn changes the electrical resistance between the plates. (Higher pressure lowers the resistance as the granules are pushed closer together.) A direct current is passed from one plate to the other and the changing resistance results in a changing current, which can be passed through a telephone system, or used in other ways in electronics systems to change the sound into an electrical signal.

- GPS

This is a third generation POT (Patch Antenna on Top) GPS module. This POT GPS receiver providing a solution that high position and speed accuracy performances as well as high sensitivity and tracking capabilities in urban conditions & provides standard NMEA0183 strings in “raw” mode for any microcontroller. The module provides current time,

date, latitude, longitude, speed, altitude and travel direction / heading among other data, and can be used in a host of applications, including navigation, tracking systems, fleet management, mapping and robotics.

This is a standalone GPS Module and requires no external components except power supply decoupling capacitors. It is built with internal RTC Back up battery. It can be directly connected to Microcontroller's USART. The module is having option for connecting external active antenna if necessary. The GPS chipsets inside the module are designed by MediaTek Inc., which is the world's leading digital media solution provider and largest fab-less IC company in Taiwan. The module can support up to 51 channels. The GPS solution enables small form factor devices. They deliver major advancements in GPS performances, accuracy, integration, computing power and flexibility. They are designed to simplify the embedded system integration process.

- **POWER SUPPLY**

The ac voltage, typically 220V rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation.

A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

- **LCD**

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segments LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

IV. SOFTWARE SYSTEM

- **IAR Embedded Work Bench**

This software is mainly used to activate ATmega 162 microcontroller according to the input received by it. Embedded code is written using this work bench. In this project, coding is written for GPS, GSM and voice playback circuit which is interfaced with ATmega 162 board at the transmitter end. As per the code embedded in the controller, the interfaced modules generate appropriate output at the receiving end.

- **ECLIPSE**

Application in android mobile device is created using Eclipse software. It is flexible and provides compatibility to create new applications in android mobile devices. Java language is preferred as the basic platform for application creation. In this project application is created using ECLIPSE which enables the parents at receiving end to visually see the place in Google map corresponding to the position of their child at transmitting end.

V. OUTPUT

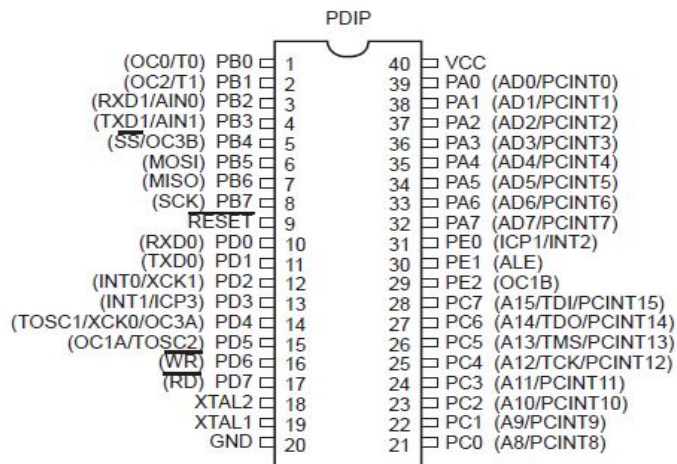


Fig.2.ATmega 162v microcontroller

The ATmega162 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. This controller filters the incoming GPS data which holds repeated six packets and forwards only the latitude and longitude values (i.e.) current position of the child to GSM.



Fig.3. GSM board

GSM module (fig.3.) receives the latitude and longitude value of the child's current position and sends it to two receivers.

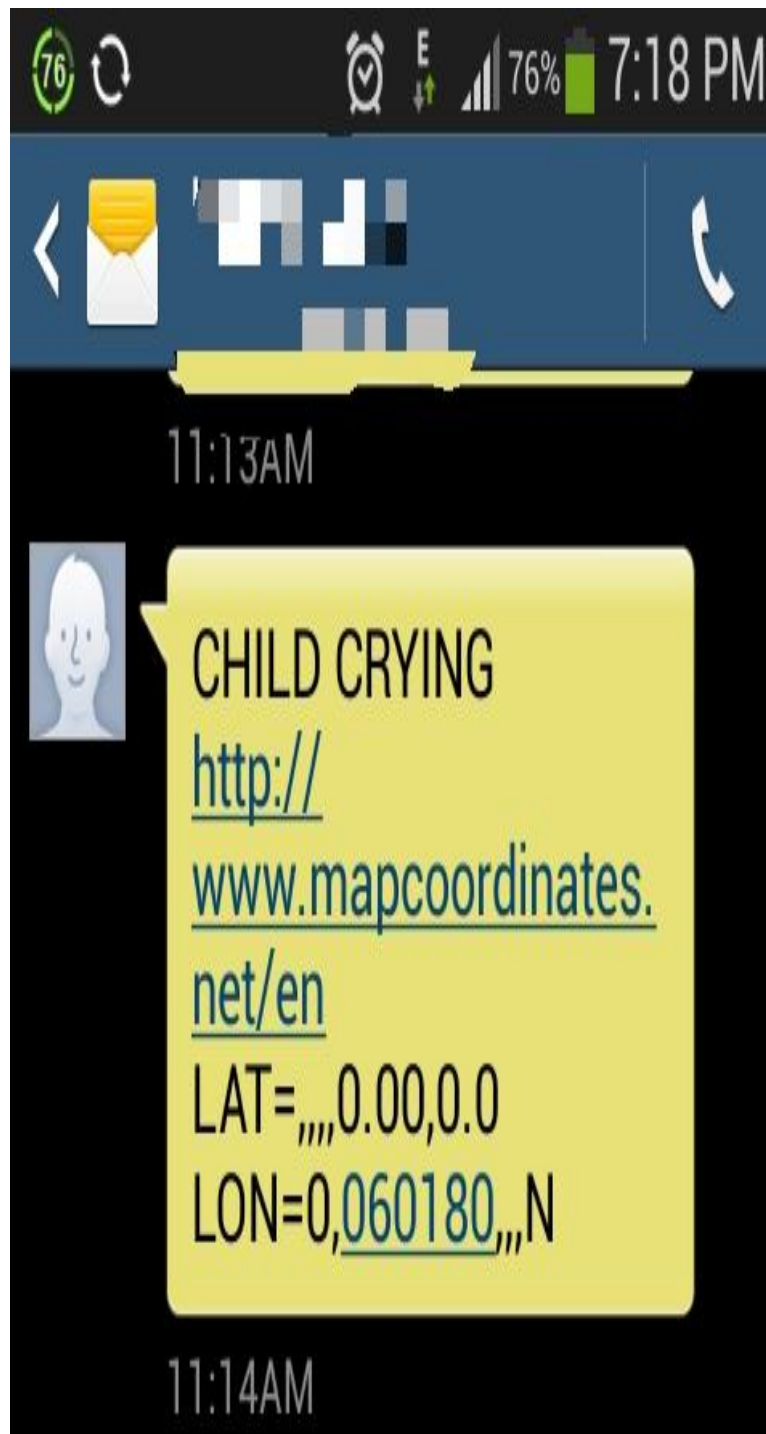


Fig.4.Output from Voice playback circuit

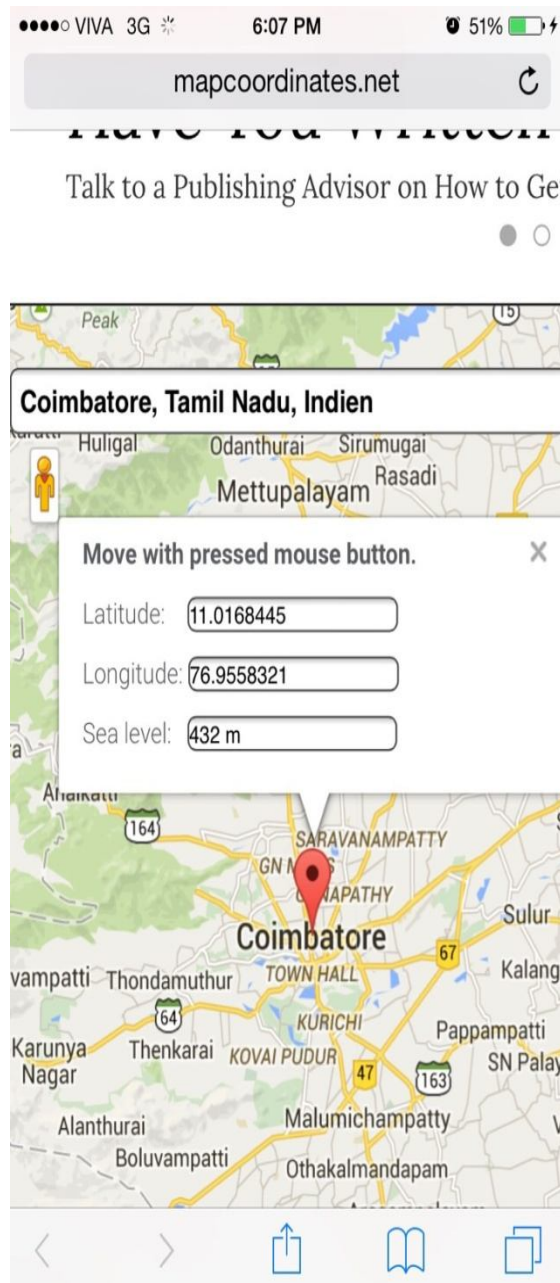


Fig.5. Output in the android phones.

VI. CONCLUSION

This project implementation primarily focuses on tracking a child's position and its location is sent to its parent and control room. It can be extended to perform the same for all children in the school by reducing the size of the child module. This project focuses on recording a child's cry and when it matches with crying of child in school the text message is sent to the its parents. It can be extended by placing voice recognizing sensors which senses the cry of all the children inside the school and send the information to their parents appropriately by using the school database.

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