GPS and GSM based Child Tracking System using Android

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Abstract— Recently many cases of kidnapping children are reported from age group 9 to 17. Parents always worry about their child. We found out that there is need of some system. This system can be used to reduce the proportion of Kidnapping. That's why we decided to do this tracking system and presented a paper. The paper proposes a solution based on GPS, GSM, and Android phone. GPS is one of the technologies that are used in a huge number of applications today. One of the applications is tracking children and keeps regular monitoring of them. This tracking system can inform the location and route traveled by a child, and this information can be observed from any other remote location. GPS takes Latitude and longitude from satellite containing Latitude and Longitude which is used to locate the child. These values are sent to the android device using GSM. Android app Takes input as Latitude and longitude SMS and redirects it to Google Map. Child location can be easily seen on the android device**.**

Index Terms- Android application ;Child Tracking System; GPS;GSM,;Latitude; Longitude.

1. INTRODUCTION

Child tracking system's main aim is to provide child safety. The latest technology like GPS are highly useful now a day, this system enables the parent to observe and track their child and find out the exact location. This new technology popularly called child Tracking System which created many wonders in the security of the Child. This hardware is fitted in the child bag in such a manner that it is not visible to anyone outside the world. This hardware consists of GSM, GPS modem, Microcontroller. GPS receives Latitude and Longitude from the satellite. These values are sending to GSM, then GSM sends these values through SMS to Android device and child can be tracked. When the child is kidnapped, the location data from tracking system can be used to find the location and can be informed to police for further action. The alert system is also designed such that if a child goes outside from specific area then Message can be sent automatically to the android device. It sends GPS coordinates to the specified mobile, computer etc. When a request by the user is sent to the number at the modem, the system automatically sends a return reply to that particular mobile indicating the position of the child in terms of latitude and longitude. A Program has been developed which is used to locate the exact position of the child on the map.

2. DESIGN OF SYSTEM

Block Diagram: The block diagram of the system is as shown in Fig1. It shows the basic building blocks of the system.
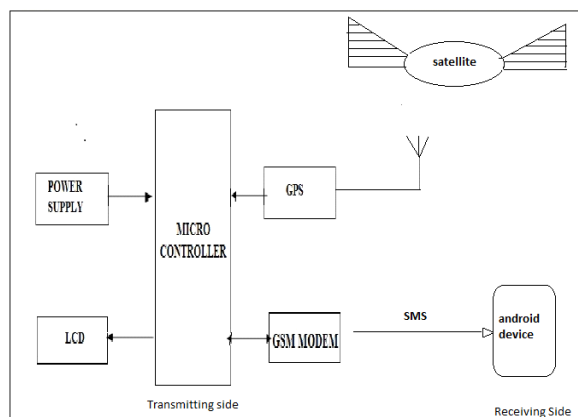
Working:

The project consists of GPS receiver and GSM modem with a microcontroller. The whole Kit is kept in child's bag at transmitter this whole setup is arranged. When a parent wants exact location they just have to send SMS to the kit. The SMS sent would come through the GSM service provider and then reach the child which is traveling. The child has a GSM device with a sim card. This SMS invokes GPS, it Takes Latitude and longitude values from satellite and these values are sent to the android device via GSM module. Latitude and longitude values then processed by the android app and It locates the exact position of the child. If Child goes outside to specific area then also location can be sent through GSM and one thing which can be noted easily that everyone uses a smartphone, So we made an app locate the child and it is very easy to use.

3. TRANSMITTER AND RECEIVER

3.1Transmitting Side:

3.1.1 Power Supply:

It supplies Voltage 5Vdc, Current500mA
1) Vo =5V, IL (max) =500mA,
RL=5V/500mA =10ohm.
2) Transformer Ratio=N = Vline(rms) / Vs(rms)
N=230/30=8
Transformer= [30V,1A]
3) Selection of Diodes:
PIV=2*Vinmax+15%=34.5V
If=IL+15%=0.575A
Diode-IN5400

3.1.2. GPS:

In this project, GPS is used to monitor the School kid position anywhere in the earth. The KIDS who wants to monitor has GPS sensor. The GPS sensor consists of GPS antenna and GPS receiver. GPS uses Triangulation method. it gives a string which consists time , latitude, Longitude, Altitude.
GPS is interfaced with microcontroller using serial port.
string:$GPGGA,123519,4807.038,N,01131.000,E,1,08,0.9,545.4,M,46.9,M,,*47.This value can be shown on lcd and send to GSM.

3.1.3. GSM:

GPS sends latitude (4807.038, N)and Longitude(01131.000,E)
To microcontroller and then this value is processed and send to GSM. The Function of GSM is to send that value to the
Parent's mobile through SMS. The GSM modem works on AT Commands such

3.2 Receiving Side:

3.2.1. Android Device:

This is Parent Side. Android app is developed to locate the exact position of the child. When SMS is received, the Latitude and Longitude value automatically redirected to google map And it will show exact position on the map.

4. SIMULATIONS

4.1. GPS Simulation:

1) First, set the baud rate 9600bps.
2) Enable RCSTA register.
3) Receive data serially.
4) Compare received data with $GPGGA string.
5) Wait for comma (,)
6) Data after the first comma is latitude.

7) Wait for the second comma.
8) The data after the second comma is longitude.
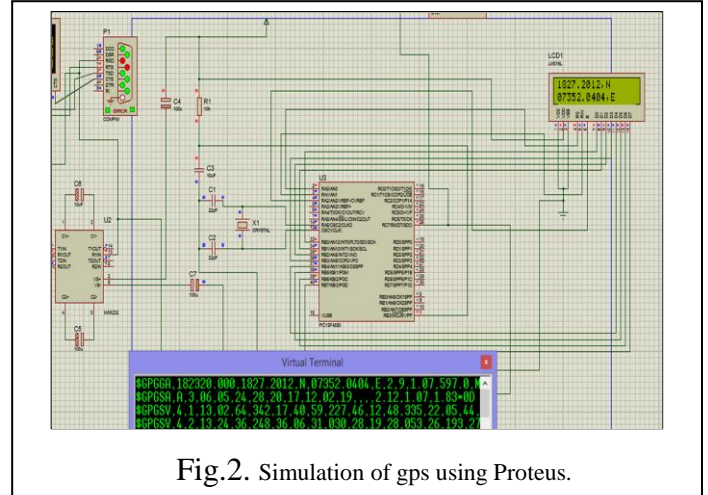9) Display this latitude and longitude on LCD and Repeat steps 4 to 9.
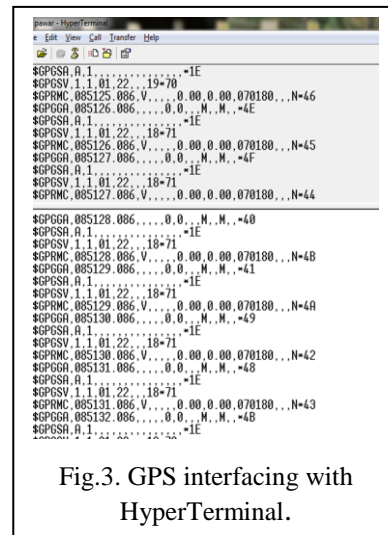

Fig.2. Simulation of gps using Proteus.

Fig.3. GPS interfacing with HyperTerminal.

4.2. GSM Simulation:

1) In this, we define two functions to call and to send SMS.
2) under these functions respective at commands are given.
3) The no. is already in the program.
4) After call Button is pressed Call ( ) function invoked and call can be made by using AT command ATD98XXXXXXX.
5)After Sending Message Button is Pressed SMS( ) function is Invoked and message can be sent by using commandAT+CMGF=1,AT+CMGS=98XXXXXXX X.Message is stored in the program.
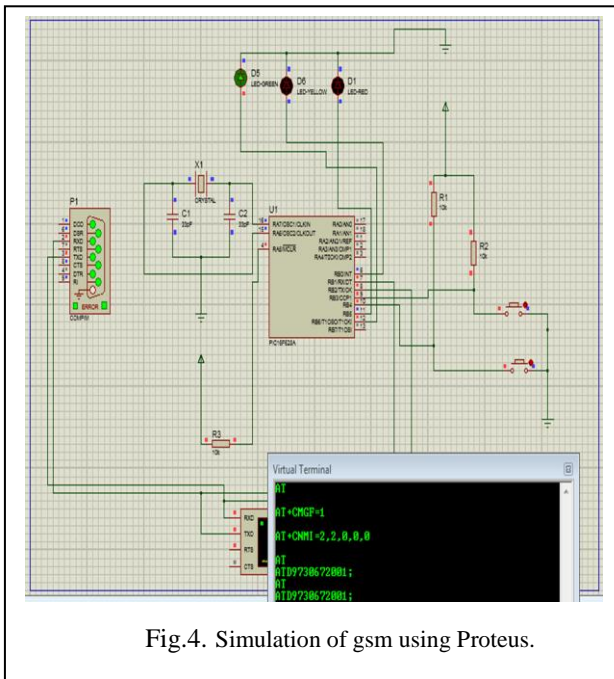
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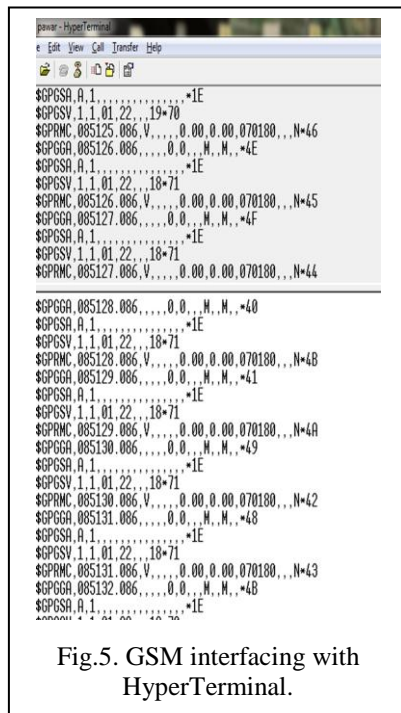
Fig.4. Simulation of gsm using Proteus.

Fig.5. GSM interfacing with HyperTerminal.

5. ANDROID APPLICATION

Using "Basic For Android" software we are designed an Android application .B4A is alternative to programming With java and Android SDK. B4A includes Visual designer That Simplifies the process Of Building user interface with a different screen size of phones or tablets. Compiled programs can be tested in AVD manager Emulator.B4A is Object oriented and event driven language.
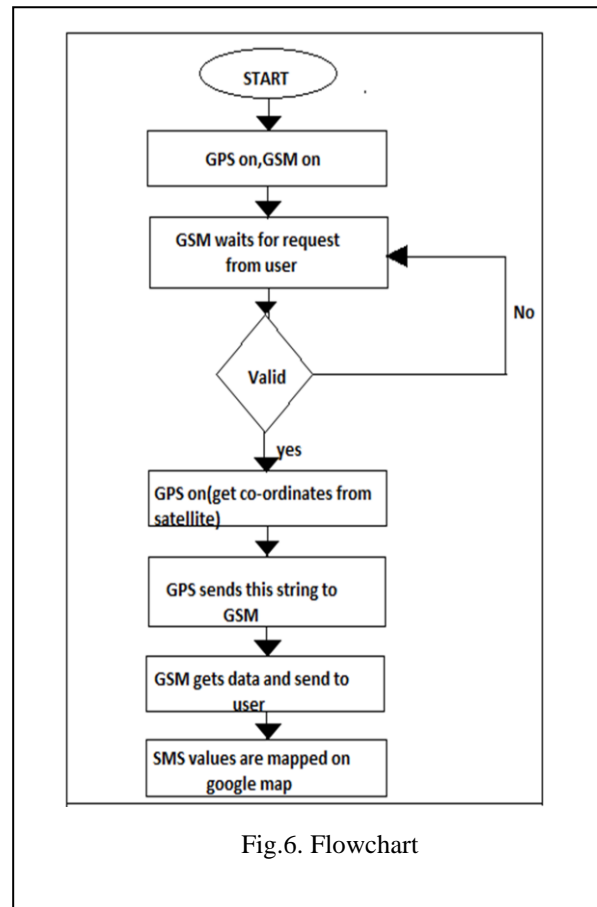
6 .FLOWCHART

Fig.6. Flowchart

7. APPLICATIONS

1) Fleet Monitoring.
2) Vehicle Scheduling
3) Route Monitoring
4) Driver monitoring system
5) Accident Analysis

8. FUTURE DEVELOPEMENTS

1) To reduce the Size of Embedded kit as it can be fitted in child's shoes.
2) Temperature sensor can be interfaced with controller.
3) To get body temperature, blood pressure details or any illness like Fever, blood pressure.
4) Increase accuracy up to 3m by increasing the cost of GPS Receivers.

9. CONCLUSION

Main Aim of the project is to Design a tracking application and embedded system to track any person, Using GPS and GSM. This project is designed to be used by parents to locate their child using this system, GSM used for SMS service. It can be also used to track vehicle. Child Tracking system has no. of applications, we can use it at various conditions and places, and the main motto of this system is track child as kidnapping proportion is increasing day by day. So for that kidnapped child, this system is useful. Parents can definitely rely on this system also this system useful for Police to find out Kidnappers. The system shows locations on google map quickly. The smallest circuit can be made in this project so it can be easily placed in a school bag or in child's shoe etc. size reduction can be possible by using small size GPS and GSM module. So this has various applications ,by using the android application it is easy to install for parent and also it is user-friendly, we are trying to keep as much simple as possible to parent and child also.

10. ACKNOWLEDGEMENT

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