Vehicle Tracking System Using GPS Tracking Technology

S.Beulah Hemalatha, M. Jasmine

Assistant Professor, Dept. of ECE, Bharath University, Chennai, Tamil Nadu, India

Assistant Professor, Dept. of ECE, Bharath University, Chennai, Tamil Nadu, India

ABSTRACT: In present days all the students are using a vehicle and mobile phones. These are necessary for any person in case of medical emergencies . MEMS Sensor automatically gives command to the controller and then SMS will send to the authority person via GSM. In the SMS Content is the position of that person in latitude and longitude. Then the authorized person enters into a danger zone depends upon with the GPS Tracking system latitude and longitude.

I. INTRODUCTION

In present days all the human beings are well known about his own time because time is precious than gold.All the persons are use a vehicle and mobile phones for his personal use. We are going to use that personal need into to use an emergency warn messaging system. In our real time clock also used to see the exact world clock time. In this wrist watch contains flexi force sensor, MEMS Accelerometer, GPS Transceiver. Sensor to detect the pressure of the human skin.MEMS Accelerometer is used to accelerates the small mechanical movement is convert to electrical signal. Sensor is used to convert the force into a digital signal. IEEE 802.15.4 protocol is used to transmit these kind of data in wireless medium. The controller also used to monitor the process of sensor and MEMS Accelerometer. To find the location using GPS Transceiver and send a warning message using GSM Technology.[1]

GPS Transceiver is used to find a person's location using and any nearby hospital is there or not. This Information is transferred using GSM Technology.[4]

II. SYSTEM ARCHITECTURE

The design is a small level of size to the use the real time clock and size it's in wrist watch. The control module MC9S08AW60, information detection module includes large range dual axis MMA621010EG and small scale three axis accelerometer sensor MMA7260QT, GPS positioning module GS -87. People machine interaction module including the keyboard and LED and then the message sending module TC35i.[3]

When a vehicle collision occurs ,dual axis accelerometer detects the level of collision and then small range accelerationsensor automatically detects the vehicle roll angle is greater than the set value given using GSM Technology to senda accident information to the owner family and rescue units.

GS -87 real time search for satellite signal through the program to extract the geographic co ordinates altitude, time, date and other information. Keyboard keys are false alarms and reported to safety.[2]   Then that authorized person of this design entered into a some kind of campus. In his wrist watch device has a switch for turned on. Then that device turned on and collects and shares all the information about that person. When a person wants to remove the device or has damaged the device then a force signal is detected by the sensor and it gives information about abnormal situations of that device. GS-87 search a satellite signal for extracting the geographic co-ordinates to the authority person means higher authority person.
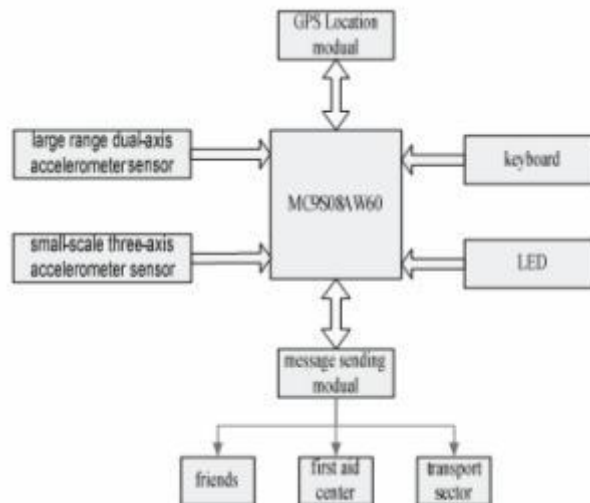
III. HARDWARE DESIGN

A.   *The Information Detection Module*

Information detection module consists of large-range dual-axis accelerometer MMA621010EG and small-scale three-axis accelerometer sensor MMA7260QT. MMA621010EG is a proven special car accident sensor which is integrated XY-axis accelerometer and built-in serial peripheral interface SPI bus, compatible with 3.3V and 5V voltage .The accelerometer has self-test function and circuit can be calibrated for performance before and after the installation. Advanced converter design to improve the sensor offset and over damped response, is available to increase system reliability and reduce the high frequency , high amplitude attenuation of the parasitic resonance. [6]

The sensor can help identify false status which may lead to an accident situation, to ensure accurate detection of accident information. Accelerometer MMA7260QT, can read low order of magnitude drop, tilt, locomote, orientation, shock and vibration errors. Sensitivity is 1.5g, 2g, 4g and 6g. It has 3 ₃A sleep mode configuration, 500 ₃A low operating current, 1.0 ms fast response power supply, which can effectively detect vehicle rollover accident information, etc.

B.   *GPS Location Module*

GPS location module GS-87 is the third generation of GPS receiver chip designed by the United States SiRF star III company, which consists of a radio frequency integrated circuit, a digital signal processing circuit and standard embedded GPS software composition .Radio frequency integrated circuit is used to detect and process GPS RF signal. Digital signal processing circuit is used to process the IF signal. The standard embedded GPS software is used search and follow up GPS satellite signals, Users to coordinate and speed is available according to the information.[5] It is a high performance, low-power intelligent satellite receiver module or called satellite engine, is a complete GPS receiver.

C. Message Transmission Module

Message transmission module is TC35i module of the German Siemens TC35 module series. This is the latest Siemens wireless modules, compatible with the TC35 functionally. TC35i supports dual-band 900MHz and 1800MHz and supports for voice, data, short message and fax service, low power.It is a highly integrated GSM module. Message transmission module and the microprocessor interface circuit shown in Figure 2.

ODBC:

Microsoft Open Database Connectivity (ODBC) is a standard programming interface for application developers and database systems providers. Before ODBC became a de facto standard for Windows programs to interface with database systems, programmers had to use proprietary languages for each database to which they wanted to connect. The choice of the database system is made almost irrelevant from a coding perspective, which is as it should be.

Application developers have much more important things to worry about than the syntax that is needed to port their program from one database to another when business needs suddenly change.[7]

The advantages of the scheme are so numerous that are probably thinking there must be some catch. of But ODBC has the drawback that it isn't as efficient as talking directly to the native database interface. Many detractors make the charge that it is too slow. Microsoft has always claimed that the critical factor in performance is the quality of the driver software that is used. In our humble opinion, this is true. The availability of good ODBC drivers has improved a great deal recently. And anyway, the criticism about performance is somewhat analogous to those who said that compilers would never match the speed of pure assembly language. Maybe not, but the compiler (or ODBC) gives the opportunity to write cleaner programs, which means finish sooner.

The 1-5,6-10 pins of TC35i are power supply pins, are connected to 3.6V power supply "+" and "-" .The 15-pin of ZIF socket is the module enable pin.[9]The serial port pins 18,19 are connected to microprocessor serial communication pins. 24-29 pins are connected to SIM card. 32-pin SYNC is connected to LED to indicate system status. LED light can indicate that TC35i is off or sleeping, SIM card is not inserted or the network login and TC35i being logged into the network is holding machine status signals.

IV. SYSTEM SOFTWARE DESIGN

The development environment for the system software is CodeWarrior 6.1 with the C program language been used. Flow chart of the program is presented in Fig.3. It is shows that the system includes the features as motorcycle accident informationdetection, GPS satellite positioning and alarm information sending.[8] After the system initialized by powered-on, it runs the sensor calibration program and system self-test program. Sending alarm information when the

system is abnormal. It is to determine to send "false alarm", "Emergency for help "and "reported safety" information by scanning keyboard signal. It is confirmed that the motorcycle accident occurred when data abnormal detected by information detection module. Position information searched by the GPS and then sent by GSM. X´Y of MMA621010EG and Z-axis of MMA7260QT connected to the AD conversion interface of the microprocessor after a RC low-pass filter. The analog signal converted to digital by the 8-bit AD. It enables the microprocessor to detect the rollover or collision accident information effectively by calculating the different roll angle and set collision acceleration threshold. According to NMEA-0183 protocol standard specifications, GPS receiver transmits the position and speed information to the PC and PDA etc. via the serial port. NMEA-0183 is a standard protocol which GPS receiver complied with. It is the most widely GPS receiver used protocol currently. According to NMEA - 0183, data is sent in statements.[10] The receiver send multiple types of statements, only a few of letters in certain statements is valid, so it needs to parse the received data, separating out the required information.GS-87 module provides a serial communication interface, this design chooses 9600bps, serial communication parameters: Baud Rate: 9600, Data bits: 8 bits, stop bit: 1 bit, no parity. The SCI communication interface of MC9S08AW60 can read data sent by GS-87, the processing program can extract the effective geographic coordinates and time information. TC35i module data input/output interface is compliant with ITU-T RS232 interface standard. Fixed parameters: 8 data bits and 1 stop bit, no parity, baud rate 300bps ~ 115kbps, hardware control signal RTS0/CTS0, software flow control XON / XOFF, CMOS level, support the standard AT command set. Because instruction content is the ASCII code and short message in Chinese is encoded UNICODE code, the transmitting data must be encoded when microprocessor control TC35i module via AT commands. For the number of Chinese characters is large and the microprocessor resources are limited, the UNICODE code must put into the microprocessor memory which related to the Chinese characters involved in the message.[11]

V. CONCLUSION

An automatic alarm device for traffic accidents is designed in this paper. It can shorten the alarm time greatly and locate the accident spot accurately, realizing the automation of accident detection and information transmission. Consequently, it will save the rescuers formasting their time in search. The experiments of model car's collision and rollover proved that this system can automatically detect corresponding accident and sent related information. Such functions can be achieved by buttons representing "false alarm", "help" and "safety", respectively.

REFERENCES

[1] Yao Jin. The discussion of Road Traffic Safety Countermeasures System [J].Private Science and Technology, 2010, (06).
[2] Prabhakar J., Senthilkumar M., Priya M.S., Mahalakshmi K., Sehgal P.K., Sukumaran V.G., "Evaluation of Antimicrobial Efficacy of Herbal Alternatives (Triphala and Green Tea Polyphenols), MTAD, and 5% Sodium Hypochlorite against Enterococcus faecalis Biofilm Formed on Tooth Substrate: An In Vitro Study", Journal of Endodontics, ISSN : 0099-2399, 36(1) (2010) pp. 83-86
[3] Wang Wei. Embedded Microcontroller MC9S08AW60 Principles and Application [M]. Beijing: Beijing Aerospace University Press, 2008.
[4] Ramkumar Prabhu, M., Reji, V., Sivabalan, A., "Improved radiation and bandwidth of triangular and star patch antenna", Research Journal of Applied Sciences, Engineering and Technology, ISSN : 2040-7459, 4(12) (2012) pp. 1740-1748.
[5] Zhu Yi, Yang Shubo. MMA series of acceleration sensor principles and application [J].Medical equipment, 2008, (04).
[6] Saravanan T., Saritha G., Udayakumar R., "A Robust H-infinity two degree of freedom control for electro magnetic suspension system", Middle - East Journal of Scientific Research, ISSN : 1990-9233, 18(12) (2013) pp. 1827-1831.
[7] Saravanan, T., Saritha, G., "Buck converter with a variable number of predictive current distributing method", Indian Journal of Science and Technology, ISSN : 0974-6846, 6(S5) (2013) pp.4583-4588.
[8] TAYLORRK, SCHROCKMD, BLOOMFIELDJ, Dynamic testing of GPS receivers [J]. Transactions of the ASAE, 2004,47 (4).
[9] TVUK Kumar, B Karthik, EB Kumaran, Visual Secret Sharing Scheme for JPEG Compressed Images, Middle-East Journal of Scientific Research 12 (12), PP 1873-1880, 2012.
[10] B Karthik, TVUK Kumar, EMI Developed Test Methodologies for Short Duration Noises, Indian Journal of Science and Technology 6 (5S), PP 4615-4619, 2013.
[11]Saravanan, T., Srinivasan, V., Sandiya, V.P., "A two stage DC-DC converter with isolation for renewable energy applications", Indian Journal of Science and Technology, ISSN : 0974-6846, 6(S6) (2013) pp. 4824-4830.
[12] SIEMENS, TC35i Hardware Interface Description [M]. April 14,2003
[13] Ma Chao. Embedded GSM message interface hardware and software design [J]. Microcontroller and Embedded Systems, 2003,
[14] Mr.B.Karthik, Dr.T.V.U. Kiran Kumar, N. Gomathi, Immobilizer Implementation using Mutual Authentication with enhanced security using 802.15.4 protocol,International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering ,ISSN 2278 - 8875, pp 142-151, Vol. 1, Issue 3, September 2012.
[15] M.Jasmin,Bus Matrix Synthesis Based On Steiner Graphs For Power Efficient System On Chip Communications ,International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, ISSN 2278 - 8875 , pp 98-104,Vol. 1, Issue 2, August 2012.

[16] M. Jasmin, A Low Power Pipelined FFT/IFFT Processor for OFDM Applications,International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering,ISSN (Print) : 2320 – 3765, pp 4712-4721, Vol. 2, Issue 10, October 2013.

[17] M Jasmin, Low Power Design of the Processer Based on Architecture Modifications,International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering,ISSN: 2278 – 8875, pp 2922-2927, Vol. 2, Issue 7, July 2013.

[18] K.Subbulakshmi,Implementation for SMS4-GCM and High-Speed Architecture Design,International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, ISSN (Print) : 2320 – 3765, pp 10965-10970, Vol. 3, Issue 8, August 2014.