

Mobile Forward Collision Warning and Vehicle Tracking Using GPS

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Abstract- Now-a-day's accidents [8] are occurring rapidly which causes the loss of life or damage of body parts which cannot be replaceable. In this paper a new alerting & avoiding system is proposed accidents can reduce the death rate due to accidents and save the people's life. The main aim of this system is to provide information to EMS, police station and family members when the accident occurred. The accident can be detected by both vibration and IR sensor which can give accurate information. It provides an additional advantage of can also track the location whenever our vehicle is lost using GPS.

Keywords- IR sensor, GPS, EMS, vibration sensor

I. EMBEDDED SYSTEMS

An embedded system [7] is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts [1]. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Embedded systems that are programmable are provided with a programming interface, and embedded systems programming is a specialized occupation.

II. BLOCK DIAGRAM

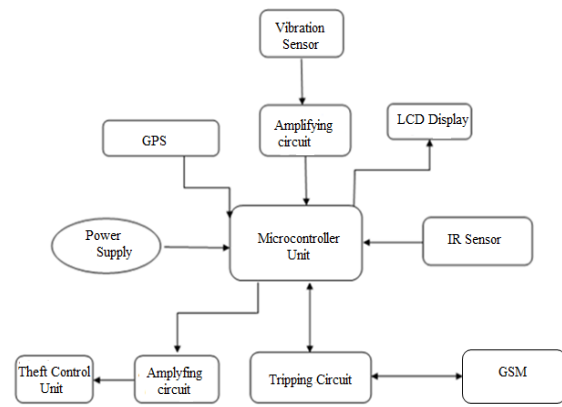


Figure 2.1: block diagram of proposed model

III. HARDWARE REQUIREMENTS

3.1 Microcontroller: The Criteria for choosing AT89S52 microcontroller [5][6] are listed below. The first and foremost criterion for choosing a microcontroller is that it must meet task at hands efficiently and cost effectively. The other considerations in this category are:

- (a) Speed: The highest speed that the microcontroller supports
- (b) Packaging: Is it 40-pin DIP or QPF or some other packaging format. This is important in terms of space, assembling and prototyping the End product.
- (c) Power Consumption: This is especially critical for battery-powered Products.
- (d) The amount of RAM and ROM on chip
- (e) The number of I/O pins and timers on the chip.

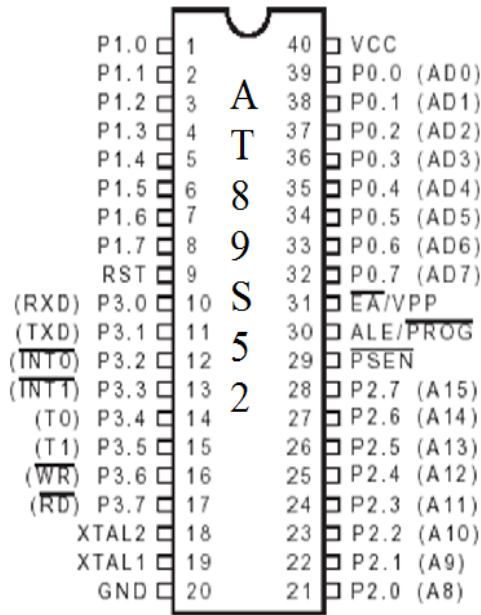


Figure 3.1: pin diagram of AT89S52 microcontroller

3.2 GSM: Global System for Mobile communications (GSM) originally from Grouper Spécial Mobile) is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 80% of the global mobile market uses the standard. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM [10] differs from its predecessors in that both signaling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system. GSM EDGE is a 3G version of the protocol.

The ubiquity of the GSM[9] standard has been an advantage to both consumers (who benefit from the ability to roam and switch carriers without switching phones) and also to network operators. GSM also pioneered a low-cost (to the network carrier) alternative to voice calls, the short message service (SMS, also called "text messaging"), which is now supported on other mobile standards as well[2].

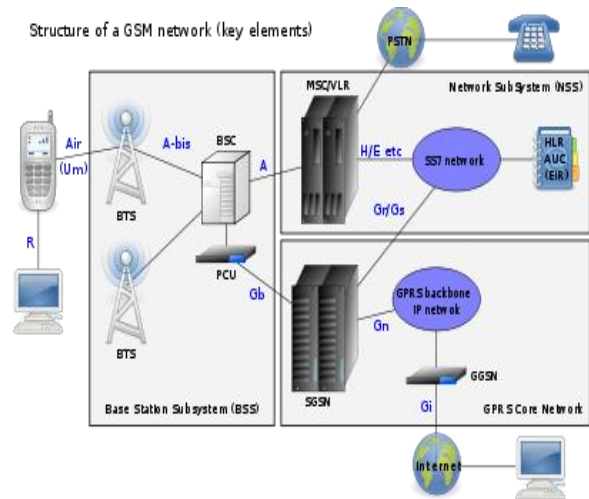


Figure 3.2: The structure of a GSM network

The network behind the GSM seen by the customer is large and complicated in order to provide all of the services which are required. It is divided into a number of sections and these are each covered in separate articles.

- The Base Station Subsystem (the base stations and their controllers).
- The Network and Switching Subsystem (the part of the network most similar to a fixed network). This is sometimes also just called the core network.
- The GPRS Core Network (the optional part which allows packet based Internet connections).
- All of the elements in the system combine to produce many GSM services such as voice calls and SMS.

3.3 GPS: The Global Positioning System (GPS) is a U.S. space-based global navigation satellite system. It provides reliable positioning, navigation, and timing services to worldwide users on a continuous basis in all weather, day and night, anywhere on or near the Earth. A GPS receiver calculates its position by precisely timing the signals sent by the GPS satellites high above the Earth. Each satellite continually transmits messages which include

- the time the message was sent
- precise orbital information (the ephemeris)
- the general system health and rough orbits of all GPS satellites (the almanac).

Three satellites might seem enough to solve for position, since space has three dimensions and a position on the Earth's surface can be assumed. A few specialized GPS applications do however use the time;

these include time transfer, traffic signal timing, and synchronization of cell phone base stations[4].

3.4 LCD INTERFACING: The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580. In this tutorial, we will discuss about character based LCDs, their interfacing with various microcontrollers, various interfaces (8-bit/4-bit), programming, special stuff and tricks you can do with these simple looking LCDs which can give a new look to your application [3].

The most commonly used LCD's found in the market today are 1 Line, 2 Line or 4 Line LCDs which have only 1 controller and support at most of 80 characters, whereas LCDs supporting more than 80 characters make use of 2 HD44780 controllers.

Pin No.	Name	Description
Pin no. 1	VSS	Power supply (GND)
Pin no. 2	VCC	Power supply (+5V)
Pin no. 3	VEE	Contrast adjust
Pin no. 4	RS	0 = Instruction input 1 = Data input
Pin no. 5	R/W	0 = Write to LCD module 1 = Read from LCD module
Pin no. 6	EN	Enable signal
Pin no. 7	D0	Data bus line 0 (LSB)
Pin no. 8	D1	Data bus line 1
Pin no. 9	D2	Data bus line 2
Pin no. 10	D3	Data bus line 3
Pin no. 11	D4	Data bus line 4
Pin no. 12	D5	Data bus line 5
Pin no. 13	D6	Data bus line 6
Pin no. 14	D7	Data bus line 7 (MSB)

Table 1: Pin description

3.4 VIBRATION SENSOR: Vibration sensors is also known as piezoelectric sensors. It is an Analog sensor. It is used to measure changes in pressure, acceleration, strain or force by converting them to an electrical charge.

3.5 IR SENSORS: Infrared waves are not visible to the human eye. IR sensor Senses surroundings by either emitting and/or detecting infrared radiation.



Figure 3.3: IR sensor

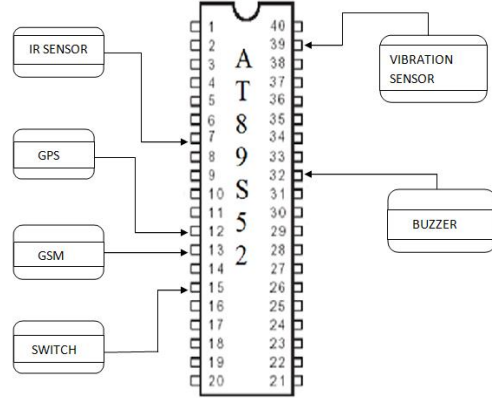
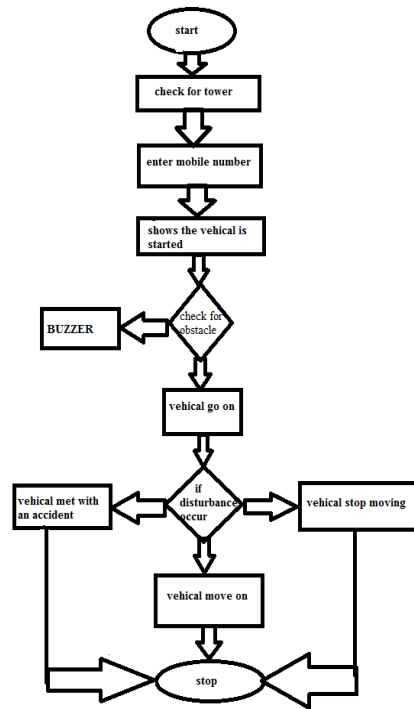


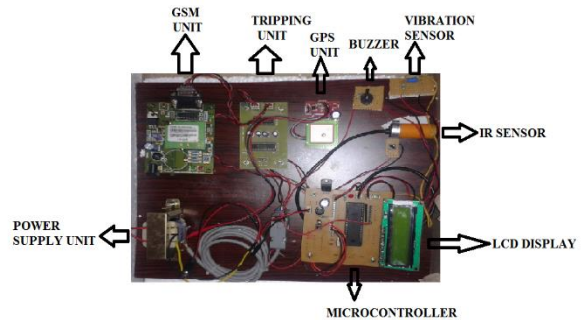
Figure 3.4: circuit diagram of proposed system

IV. FLOW CHART

The flow chart of the proposed system is as follows



V. SNAPSHOT OF THE PROJECT



VI. CONCLUSION

This Paper “MOBILE FORWARD COLLISION WARNING AND VEHICLE TRACKING USING GPS” has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC's and with the help of growing technology this paper has been successfully implemented.

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