Accident Avoidance Using Intelligent Sensors

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Abstract:

Security in travel is primary concern for everyone. This project describes a design of effective alarm system that can monitor an automotive condition in travelling. This project uses a piezo-electric sensor which can detect the abrupt vibration when accident occurred. This project presents automatic accident detection by using gps and gsm modems. This system uses smps regulated power supply for the microcontroller unit. This is provided by the 12V, 1Amp transformer. Recharging unit also requires regulated 5V supply, which is provided by a separate 12V and 750mA transformer.

Key words:

GSM, GPS, Lpc2148 Controller.

I. Introduction:

The main aims of an accident avoidance system are to avoid a loss of life and provide a safety mechanism for the driver. Speeding, drunk driving, seat belt adjustments, and low use of helmets all lead to accidents. Every hour, 40 people under the age of 25 die in road accidents. Most city accidents are due to driver carelessness, but outside the city, accidents mostly occur due to drunken driving. Accidents may also occur due to health conditions, that is, drowsiness, the driver may fall sleep and unconscious. Loss of life is mainly due to heart attacks and drunken driving, so this can be reduced using different techniques. Alcohol detection methods, obstacle detection systems, drowsiness monitoring system and accident detection methods are used to minimize the frequency of accidents. For alcohol detection, gas detecting sensors are used. To identify the obstacle ir sensor is used. It is also possible for a vehicle to identify the location of people using gps modem. This vehicle interconnected with alarm system and alert msg sends to owner through the gsm. Automatically stops the vehicle so a person's life can be saved.

II. Over View of Algorithm:

In accident avoidance system, drunken driving prevention, accident detection, and drowsiness, collision detection methods are all used. These preventative methods are mainly used for avoiding accidents. Accidents mainly occur due to the large number of private vehicles. These vehicles create a serious problem in day-to-day life. If a driver consumes any alcohol or drugs, they can lose consciousness and create an accident. Accidents can also occur due to health conditions such as chest pain or high blood pressure. Finally, if a person is inside vehicle without the owner's knowledge this can also lead to death, if there is not enough oxygen inside the vehicle. The three methods of drunk driver prevention, person detection, and heart rate measurement methods are used. These three methods are mainly used to avoid accidents and thus save human life.

The ARM controller LPC 2148 is programmed to detect alcohol, human alcohol level, Signals from the sensor are received by the controller, the data is compared and processed for a result. Drivers are asked to blow air into the alcohol sensor unit to detect the alcohol level present in the driver's breath. The hardware detector module is latched inside the vehicle and GSM technology is used to transmit signals. The signals are processed in the lab using LABVIEW. For accident detection we are using a vibration switch which internally buffers a piezoelectric transducer. When the vehicle is crammed with any another or to any objects then the switch comes into contact with piezo material. Then the piezo material generates measurable output voltage that is proportional to applied force or stress. This output voltage is further processed to activate the GPS and GSM to send SMS to owner.
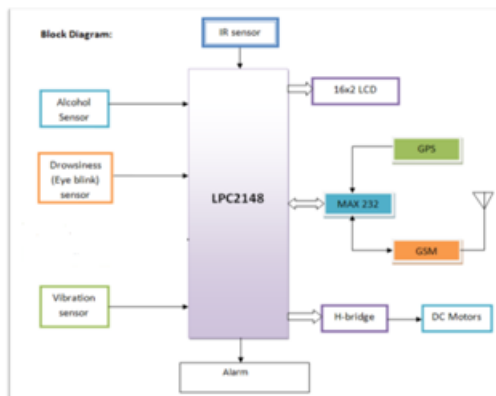
Hardware Modules:

A. LPC2148 Controller:

The LPC2148 are based on a 16/32 bit ARM7TDMI-S™ CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory.
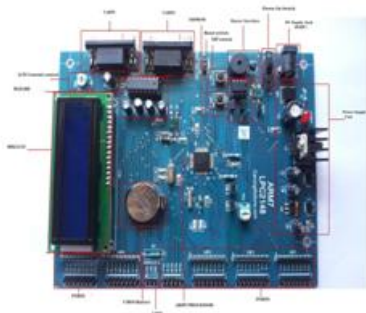
A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB PORT,PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale. With a wide range of serial communications interfaces, they are also very well suited for communication gateways, protocol converters and embedded soft modems as well as many other general-purpose applications.
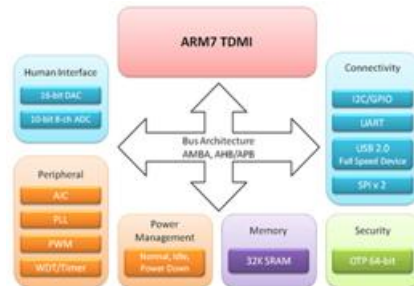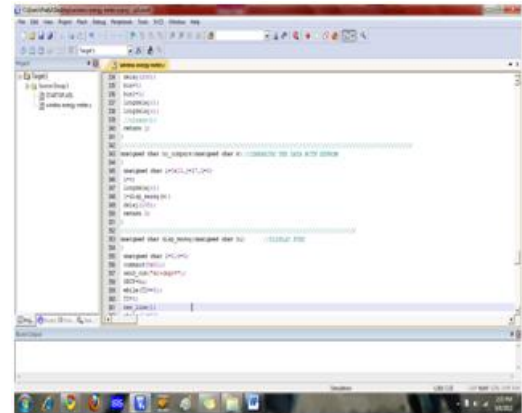

B. GPS:

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 which has an unobstructed view of four or more GPS satellites. GPS has become a mainstay of transportation systems worldwide, providing navigation for aviation, ground, and maritime operations. Disaster relief and emergency services depend upon GPS for location and timing capabilities in their life-saving missions. The accurate timing that GPS provides facilitates everyday activities such as banking, mobile phone operations, and even the control of power grids. Farmers, surveyors, geologists and countless others perform their work more efficiently, safely, economically, and accurately using the free and open GPS signals.

C. Global System for Mobile Communication:

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication.

GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.
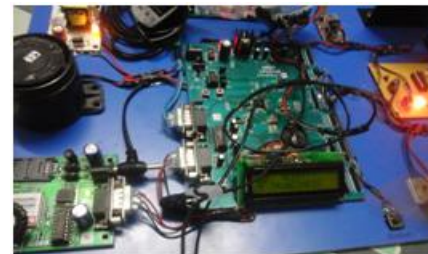

PERFORMANCE EVALUATION:

The performance evaluation is divided into two parts: driving while drunk and high form of drugs.

III SOFTWARE DETAILS

Keil Compiler:

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

IV ADVANTAGES:
1. Ease of maintenance
2. Sophisticated security.
3. Less power consumption
4. Alert message to mobile phone for information.
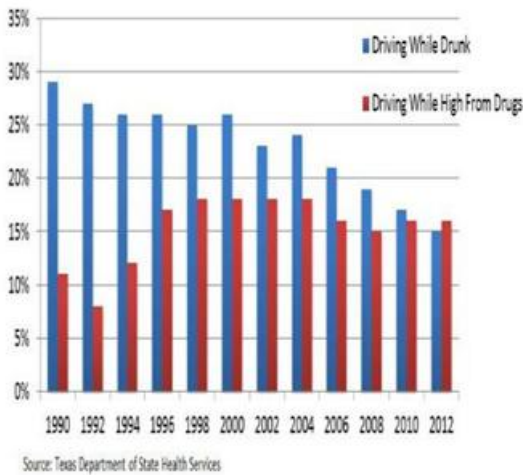
V.APPLICATIONS:
1. Automotive vehicles.
2. Security, remote monitoring, transportation and logistics.

VI.RESULT:

VII.Conclusion:

Accident Avoidance Using Intelligent Sensors devices indulge with the recent technology and includes the methodology based on the combination of GPS, GSM and many other modules by the help of which immediate support can be provided to anyone in need of it.

This project is microcontroller based project .As a part of As a part of studying the analysis circuits and programs were simulated on Micro vision 4 Keil ,Hardware implementations are done using PCB layouts and EXPRESS PCB. In this paper a brief description is provided by the medium of Block Diagram and Flow diagrams as well as the introduction of technology. Also the results and implementation is being discussed here.

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