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Design and Implementation of Smart Car Driving

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Abstract
In this paper the system used which consist of different types of sensors such as alcohol sensor, eye blink sensor, tilt sensor and also mainly used GSM modem, GPS receiver. The eye blink sensor is used to sense the person driving the vehicle is sleeping or not. Tilt sensor is used to identify weather the vehicle is running in normal condition or not when the accident occurs. it send the information to the controller system. The Alcohol Sensor is used to sense weather the person driving the car taken Alcohol or not and this data is also given to ADC. The ADC is used in this system because the signal comes from the Sensor are analog in nature, so we want to convert the analog signals into digital signal for this purpose ADC is used. GSM and GPS based vehicle location and tracking system will provide effective, real time vehicle location, mapping and reporting this information value.

Key words— Microcontroller, Alcohol Sensor, Eye blink sensor, Tilt sensor, GPS & GSM module.

INTRODUCTION
The Objective of this project is to develop a system to keep the vehicle secure and protect it by the occupation of the intruder.
*"*Driving to save lives, time, and money in spite of the conditions around you and the actions of others.*"*
This is the slogan for Defensive Driving. Vehicle accidents are most common if the driving is inadequate. These happen on most factors if the driver is drowsy or if he is alcoholic. Driver drowsiness is recognized as an important factor in the vehicle accidents. It was demonstrated that driving performance deteriorates with increased drowsiness with resulting crashes constituting more than 20% of all vehicle accidents. But the life lost once cannot be re-winded. Advanced technology offers some hope avoid these up to some extent. This project involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. This output is give to logic circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is fixed in vehicle where if anybody looses conscious and indicate through alarm. A car simulator study was designed to collect physiological data for validation of this technology. Methodology for analysis of physiological data, independent assessment of Driver drowsiness and development of drowsiness detection algorithm by means of sequential fitting and selection of regression models is presented.
Methods:
The following method are used,

1. Alcohol sensor 2**.** Eye blinking sensor 3.Tilt sensor 4. GPS & GSM module

1. ALCOHOL SENSOR:

Sensitive material of MQ-2 gas sensor is SnO2, which with lower conductivity in clean air. When the target combustible gas exist, the sensor's conductivity is higher along with the gas concentration rising. Please use simple electronic circuit, Convert change of conductivity to correspond output signal of gas concentration. MQ-2 gas sensor has high sensitivity to LPG, Propane and Hydrogen, also could be used to Methane and other combustible steam, it is with low cost and suitable for different application.

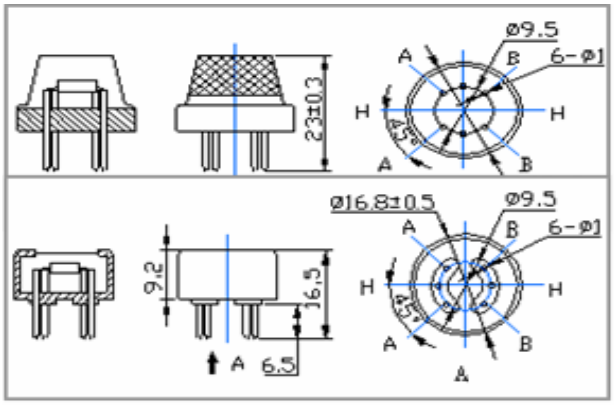
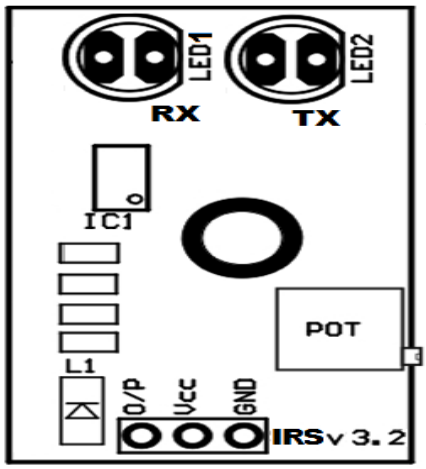


Fig (1): Alcohol Sensor [1-5]

An alcohol sensor is a device which detects the presence of alcohol within an area, usually as part of a safety system. This type of equipment is used to detect an alcohol and interface with a control system so a process can be automatically shut down. An alcohol sensor can also sound an alarm to operators in the area where the detect is occurring, giving them the opportunity to leave the area. This type of device is important because the alcohol can be harmful to organic life, such as humans.[2]

2. EYE BLINK SENSOR:

This project involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. This output is give to logic circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is fixed in vehicle where if anybody looses conscious and indicate through alarm. Infrared transmitter is one type of LED which emits infrared rays generally called as IR Transmitter. Similarly IR Receiver is used to receive the IR rays transmitted by the IR transmitter. One important point is both
IR transmitter and receiver should be placed straight line to each other.



Fig(2): Eye blink sensor[1-5]

The transmitted signal is given to IR transmitter whenever the signal is high, the IR transmitter LED is conducting it passes the IR rays to the receiver. The IR receiver is connected with comparator. The comparator is constructed with LM 358 operational amplifier. In the comparator circuit the reference voltage is given to inverting input terminal. The non inverting input terminal is connected IR receiver. When interrupt the IR rays between the IR transmitter and receiver, the IR receiver is not conducting. So the comparator non inverting input terminal voltage is higher than inverting input. Now the comparator output is in the range of +5V. This voltage is given to microcontroller or PC and led so led will glow. When IR transmitter passes the rays to receiver, the IR receiver is conducting due to that non inverting input voltage is lower than inverting input. Now the comparator output is GND. So the output is given to microcontroller or PC. This circuit is mainly used to for counting application, intruder detector etc.[3]

3. TILT SENSOR:

Fig (3): Tilt Sensor[1-5]

Tilt sensors are devices that produce an electrical signal that varies with an angular movement. These sensors are used to measure slope and tilt within a limited range of motion. Sometimes, the tilt sensors are referred to as inclinometers because the sensors just generate a signal but inclinometers generate both readout and a signal. It is composed of sealed glass tuve, electrode and mercury. Circuit on &off, free angle, flexible control can be achieved by liquidity of mercury. High temperature fire and making, it can be made any shape. Widely used on control of water level (liquid level), warning device, checkout gear, communication equipment, instrumentation and etc to transmit signal and control.

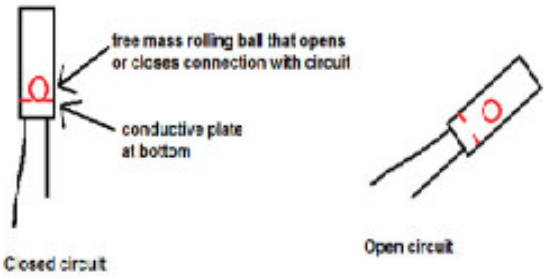


Fig (4): Working Of Tilt Sensor [1-5]

These sensors consist of a rolling ball with a conductive plate beneath them. When the sensor gets power, the rolling ball falls to the bottom of the sensor to form an electrical connection. When the sensor is tilted, the rolling ball doesn't fall to the bottom so that the current cannot flow the two end terminals of the sensor.[5]

4. GPS AND GSM:

Fig (5): GSM Module [1-5]

The system can correctly send the position of vehicle to the server center by GPS positioning. The GPS module obtains the precise locality by parsing received GPS signal. The GPS module can receive the data by connected to microcontroller development-board through RS232 port. When the microcontroller chip sends the instruction to GPS module, the GPS module starts receiving the data and saves it into memory. This instruction sends the region information with the vehicle license information to the support-server center through GSM net. Because the system is based on GPS data which is sent through GPRS net, it must be initialed at first. A GSM modem is a wireless modem that works with a GSM wireless network.

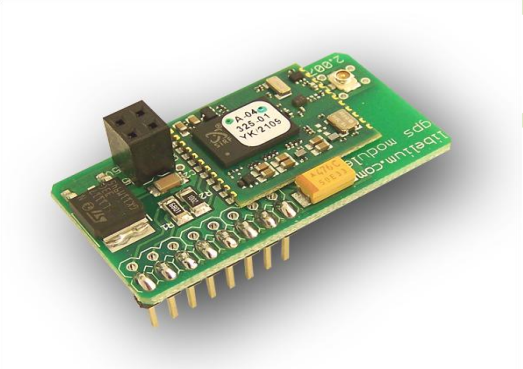


Fig (6): GPS Module [1-5]

A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. The GSM module can send the information out b SMS message, including real time position of the "lost" car and even the images of "the driver". A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. A GSM modem can be an external device or a PC Card / PCMCIA Card. Typically, an external GSM modem is connected to a computer through a serial cable or a USB cable.[4]

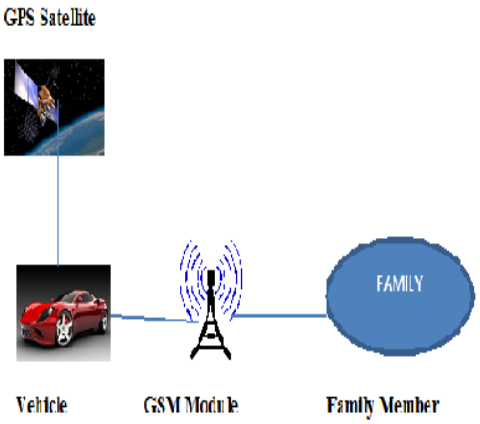


Fig (7): GPS and GSM System [1-5]

5. MICROCONTROLLER 89S52:

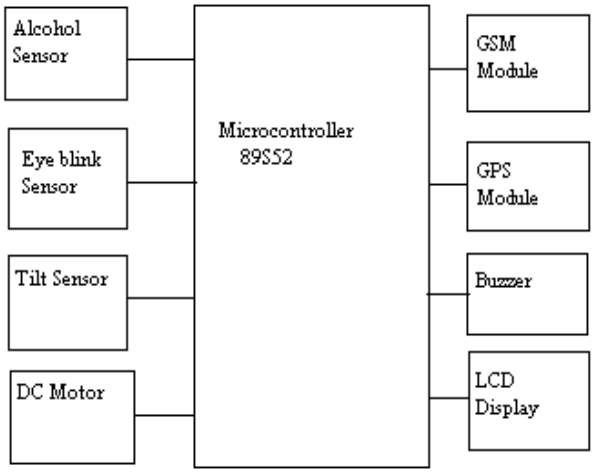


Fig.(8) Block Diagram

The Atmel AT89 series is an Intel 8051-compatible family of 8 bit microcontrollers (µCs) manufactured by the Corporation. Based on the Intel 8051 core, the AT89 series remains very popular as general purpose microcontrollers, due to their industry standard instruction set, and low unit cost. This allows a great amount of legacy code to be reused without modification in new applications. While considerably less powerful than the newer AT90 series of AVR RISC microcontrollers, new product development has continued with the AT89 series for the aforementioned advantages. All four ports in the AT89C51 and AT89C52 are bidirectional. Each consists of a latch (Special Function Registers P0 through P3), an output driver, and an input buffer. The output drivers of Ports 0 and 2, and the input buffers of Port 0, are used in accesses to external memory. In this application, Port 0 outputs the low byte of the external memory address, time-multiplexed with the byte being written or read. Port 2 outputs the high byte of the external memory address when the address is 16 bits wide. Otherwise the Port 2 pins continue to emit the P2 SFR content. All the Port 3 pins, and two Port 1 pins (in the AT89C52) are multifunctional. The alternate functions can only be activated if the corresponding bit latch in the port SFR contains a 1. Otherwise the port pin is stuck at 0. It has less complex feature than other microprocessor.[1]

LITERATURE REVIEW:

This project involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low.This to know the eye is closing or opening position This output is give to logic circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is fixed in vehicle where if anybody looses conscious and indicate through alarm. A car simulator study was designed to collect physiological data for validation of this technology. Methodology for analysis of physiological data, independent assessment of driver drowsiness and development of drowsiness detection algorithm by means of sequential fitting and selection of regression models is presented.

SCOPE AND OBJECTIVE:

The Objective of this project is to develop a system to keep the vehicle secure and protect it by the occupation of the intruders. Involves controlling accident due to unconscious through Eye blink.

PROPOSED WORK:

It is due to the driver's fatigue, traffic accidents keep with a yearly increasing of a high rate. This paper shows the new fatigue detection algorithms & techniques using eye blink, alcohol, Tilt etc. sensors. In this technique the fatigue will be detected immediately and regular traps the events driver and third party. Through research presented in this paper, we propose an intelligent car system for accident prevention and making the world a much better and safe place to live.

RESULT:

If the alcohol is detected in humans breathe then the car will be stop or will not be start. While driving if driver is sleeping then the car will automatically stop and driver is alerts by buzzer. In case if accident occurs then using GPS and the position and location of the car is detected and using GSM module the message of particular location is send to the relatives of the driver.

CONCLUSION:

Accidents occurred due to drowsy and driver cant able to control the vehicle, when he/she wakes. The drowsiness is identified by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame. The alcohol consumption is also verified during the starting process of the vehicle using alcohol detector.

If the driver is drunk then the buzzer indicates and the vehicle does not allow the driver to start the vehicle after collecting all information which is stored in internal memory, μC send this data to base or surveillance unit via SMS using GSM modem. The GPS smart receiver features the 16channels, Ultra low power GPS architecture.

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