

Detecting Driver Drowsiness And Driver Alert System

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ABSTRACT

There has been a very large increase in road accident due to drowsiness of driver while driving which leads to enormous number of accidents. The driver lose his control on vehicle when he falls sleep which leads to an accident. This is because while sleeping the driver is not able to control his vehicle at very high speed on the road. This project can generate a model which can prevent such accidents that are cause due to the drowsiness of driver. Temperature sensor, smoke sensor and alcohol sensor are also used for further safety system in the vehicle. Purpose of the project is to reduce the number accident occurs due to drowsiness of driver and some other reasons.

Keywords: IR sensor, Temperature sensor, Smoke sensor, Alcohol sensor, microcontrollers(unio)

1. INTRODUCTION

Driver fatigue is a major factor in a large number of vehicle accidents. The development of technologies for detecting or preventing drowsiness is a major challenge in the field of accident avoidance systems. The aim of this project is to develop a prototype of drowsiness detection system. The focus will be on designing a system that will accurately monitor the open or closed state of the driver's eyes in real-time. In today's world where science has reached to new level so have the recent cars. These cars are more advanced than ever. But now a days, due to driver drowsiness accidents are increasing day by day. Due to drowsiness drives do rash driving and they do not have control on themselves and leads to the accident. Here we designed a system which will detect driver drowsiness. The second application of this project is to detect the alcohol content or any leakage of gas from the vehicle, once it deduct such sensation the LED light glows indicating emergency and this project also deals with temperature sensors, in case of any kind of fire inside the vehicle the sensor senses and stops the engine. For the alert systems, we have a beeper device. we had also used GSM modem so the message can also be send to provided phone number if any problem happens. The project code is developed in C language and then converted to hex code which can be readable by microcontroller(unio).

2. OBJECTIVES

- Driver drowsiness detecting system is a driver safety system which will detect the drowsiness of the driver and alert him. Studies says that more than 20% of the accident occur on road's are fatigue related and this percentage reached up to 50%. To prevent them this system is crated. Objective of the project is assure the safety of the driver and prevent the accident occur due to driver falling to sleep.
- Number accident increasing day by day due to many reasons and one of them id drowsiness of the driver so our project help to detecting the sleep and help to wake him up or stop the car in real time to reduce the accident.
- Second objective of the project is to detect the alcohol content, any kind of temperature change and send message to provided number for more safety purpose.
- GPS system is also added so that one can easily find out location of the vehicle. Implanting the GPS is most important due to a reason that help can't be send without knowing the location.

3. FUNCTIONAL BLOCK DIAGRAM

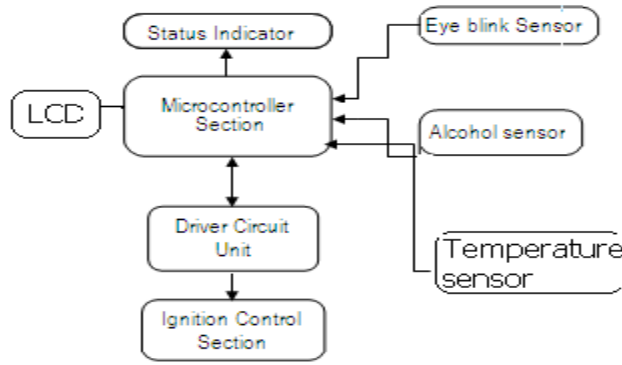


Figure 1 :- Function block diagram of Driver Drowsiness detecting System.

4. FLOW CHART OF WORKING MODEL



Figure 2:- Working model of driver sleeping alert system

5. DESCRIPTION OF PROJECT ELEMENTS

- **Arduino:-** Arduino is an open source computer hardware and software company, project. Its operating voltage is 5v. Microcontroller is ATmega328 and has 14 digital along with 6 analog pins.

Sr. No.	Description	Specification
1.	Microcontroller	Atmega328P
2.	Operating Voltage	5V
3.	Supply Voltage	7-12V
4.	DC Current per I/O Pin	20 mA
5.	Flash Memory	32 KB
6.	Clock Speed	16 MHz

Table 1:- Arduino Specification

- **Eye Blinking Sensor:-** Eye blinking sensor will monitor the eye pupil and compare the normal blinking of human eye with the sleeping one in real time.
- **IR Sensor:-** IR sensor is type of LED which emits infrared rays generally called as IR Transmitter and IR Receiver is used to receive the IR rays transmitted by the IR transmitter. IR sensor compare the state of the eye with help comparator which will compare the signal by IR sensor. Accordingly will send command to the system.
- **LCD:** Liquid Crystal Display (16X2) screen is an electronic display module and finds a wide range of applications. It operates at 5v and has 5x8 dots including cursor.
- **Temperature Sensor:-** Thermistors are used because they are thermally sensitive resistors whose prime function is to exhibit a large predictable and precise change in electrical resistance when subjected to a corresponding change in body temperature. Negative Temperature Coefficient thermistors exhibit a decrease in electrical resistance when subjected to an increase in body temperature and Positive Temperature Coefficient thermistors exhibit an increase in electrical resistance when subjected to an increase in body temperature. Once the temperature change is sense then buzzer will ring.
- **Alcohol Sensor:-** Alcohol Gas Sensor MQ3 It is a low cost semiconductor sensor which can detect the presence of alcohol gases at concentrations from 0.05 mg/L to 10 mg/L. The sensitive material used for this sensor is SnO₂, whose conductivity is lower in clean air. It's conductivity increases as the concentration of alcohol gases increases. It has high sensitivity to alcohol and has a good resistance to disturbances due to smoke, vapor and gasoline. This module provides both digital and analog outputs. MQ3 alcohol sensor module can be easily interfaced with Microcontrollers, Arduino Boards, Raspberry Pi etc.
- **SIM 808 GSM/GPRS/GPS Module:-** SIM808 module is a GSM and GPS two-in-one function module. It is based on the latest GSM/GPS module SIM808 from SIMCOM, supports GSM/GPRS Quad-Band network and combines GPS technology for satellite navigation. It features ultra-low power consumption in sleep mode and integrated with charging circuit for Li-Ion batteries, that make it get a super long standby time and convenient for projects that use rechargeable Li-Ion battery. It has high GPS receive sensitivity with 22 tracking and 66 acquisition receiver channels. The module is controlled by AT command via UART and supports 3.3V and 5V logical level.

6. WORKING PRINCIPLE

Implementing an automated driver sleeping alert system to vehicles that provides high safety to driver includes designing an eye blink sensor which continuously monitors the number of times the eye blinks, if the eye blinks count decreases that means the driver is sleepy at that time buzzer will turn on. This paper involves measuring the eye blinks using IR sensor. There are two sections in 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 then the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye closing or opening position. In the transmitter section, eye blink sensor is placed near the eye to sense the blink count and this information is transmitted in the form of pulses and is given to the Microcontroller. The processor uses this information to compare with the normal eye blink programmed in the chip and if any abnormal situation arises then buzzer will indication. In Receiver side the transmitted signal is received and the signal is decoded and given to the Microcontroller, which uses this information for displaying the alert message in the LCD as programmed, simultaneously a buzzer alert is given to weak up the driver immediately.

7. RESULT AND CONCLUSION

The analysis and designing of driver drowsiness detection system and alert system is done. This system will help to avoid various road accidents caused by drowsy driving and also this system used for security purpose of a driver to caution the driver if any fire accident or any gas leakage .This paper involves avoiding accident to unconsciousness through Eye blink. Here one eye blink sensor is fixed in vehicle where if driver lose his consciousness, then it alerts the driver through buzzer to prevent vehicle from accident. The alcohol and temperature sensor are used for further safety system used in the vehicle. Development of a hybrid microcontroller for a vehicle which also consists of an alcohol and temperature detector which will sense if the driver is drunk then it will send message will location so that one can take action. A complete study on road safety is going to be the next boom for the automobile industry for it to flourish and survive every human from the risk.

8. FUTURE SCOPE

This project will be going to quit use full in future that we can develop a system that stop the car and park it automatically and it will so quick and fast in analyzing the condition of driver from each position and help to reduce the number of accident in future.

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