

# Drowsy Driving Detection System

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**Abstract-**In this paper, we propose a drowsy driving detection system in which sensors like alcohol sensor, accelerometer, IR sensors are used for detection of drowsiness and alcohol consumption by driver. In addition to that we have used GPS receiver and GSM modem, for communication with the remote control station. The system used in the vehicle will continuously send the readings obtained from various sensors and current position of the vehicle which will obtain from GPS receiver to the control station. As a result we get immediate information related to the driver's condition. Detail design criteria with respect to various sensor and system are given. The proposed system will accurately derive the various parameters and inform control room.

**Index Terms-** Alcohol consumption, control room, drowsiness, position.

## I. INTRODUCTION

Driver fatigue is a significant factor in a large number of vehicle accidents. The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because of the hazard that Drowsiness presents on the road, methods need to be developed for counteracting its affects.

The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed 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 made amazing advances so have the recent cars. These cars are more advanced than ever. But now days, as the alcohol consumption is increasing within the peoples so the accidents are increasing day by day. Driver consumes alcohol and then they do rash driving as of that they do not have control on themselves. Here we are designing a system which will detect the consumption of alcohol by the driver. Once detected, the vehicle will turn off the ignition and the buzzer will start buzzing.

## II. SYSTEM DESIGN

The design of the system starts with basic block diagram of the system which is shown in Fig 1. This system basically consists of accelerometer, alcohol sensor, IRsensor, temperature sensor, 4x3keypad, buzzer, relays, GPS and GSM interfaced with the microcontroller ARM7 (LPC2138). This system also has the theft control mechanism. The driver need to punch the password within 30 seconds while entering into car else buzzer will start buzzing and an SMS will be

send to owner of the car.

**Alarm Section:** It is used in a system to indicate or to grab the attention regarding an emergency situation occurred. Buzzer act as a panic horn which indicates the need of instant attention as the condition goes haywire.

**Alcohol Sensor:** Alcohol sensor is used to detect weather the person have consumed the alcohol or not. The sensor which we have used is MQ3 sensor.

**Eye Blink Sensor:** Eye blink sensor is used to detect the rate of blinking of human eyes.

**Accelerometer:** An accelerometer is a device that measures proper acceleration, also called the four-acceleration. This proper acceleration is associated with the weight of a test mass.

**Microcontroller:** Microcontroller is used to perform various function and operations is ARM7 i.e.LPC2138.

**GSM Modem:** For reception of data through wireless media, GSM modem used in project is SIM 300.

**GPS Modem:** It is used to track the correct position of vehicle with the help of goggle maps.

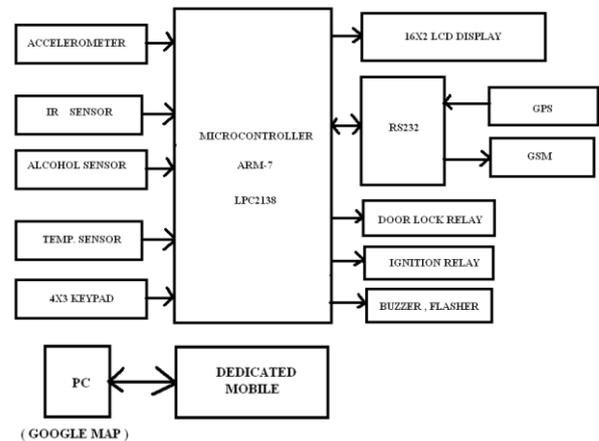


Fig-1: Block Diagram

### A. Block Diagram Description

This system basically consists of accelerometer, alcohol sensor, IR sensor, temperature sensor, 4x3keypad, buzzer, relays, GPS and GSM interfaced with the microcontroller ARM7. This system will detect the alcohol consumption of the driver. As alcohol consumption is increasing within the youth so the accidents are increasing day by day. Driver consumes alcohol and then they do rash driving as they do not have control on themselves.

Here we are designing a system which will detect the consumption of alcohol by the driver. Once detected, the vehicle will turn off the ignition and the buzzer will start. If driver start feeling drowsy then the accelerometer will detect and will turn off the ignition and the buzzer will start. By IR sensor interfaced the speed of the car will be kept under control. Once set the speed limit the driver will not be able to accelerate the car higher than the set speed. GPS interfaced with microcontroller will continuously transmit the location of car on GOOGLE map to the base station.

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This system also has the theft control mechanism. The driver needs to punch the right password while entering the car. The driver need to punch the password within 30 seconds else the buzzer will start buzzing and an SMS will be send to the owner of the car. All these parameters are transmitted to the base station with the help of GSM modem and at base, there is a PC where we have developed a VB window on which all these parameters and the location of the car on GOOGLE map will be displayed.

### B. Circuit Diagram

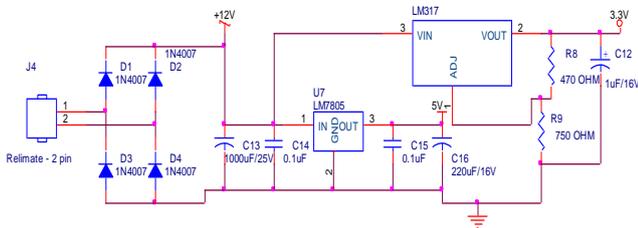


Fig-2: Power supply Circuit Diagram

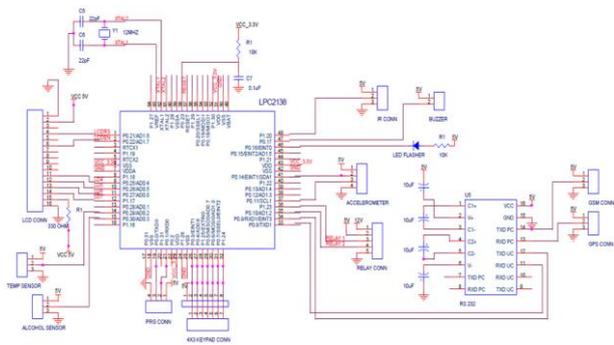


Fig-3: Main Circuit Diagram

### C. Explanation of Circuit Diagrams

Referring to the Fig-2, it shows the power supply section of the system which consists of transformer of output 12 voltage and current of 750mA, which is then followed by the bridge rectifier circuitry of diodes (1N4007).At the output of this, we get pulsating DC voltage of 5.75 volts. This pulsating voltage is then applied to the filter circuitry consists of electrolytic capacitors. At this stage we get the pure DC voltage. The further part of the power supply circuit consist of the fixed voltage regulator IC 7805,which gives regulated output of 5 volts. This 5 volt supply is provided to the many components of the system such as LCD display, IR sensor, Alcohol sensor, temperature sensor, relays, MAX 232 IC, buzzer, accelerometer. The fixed regulator circuitry followed by variable voltage regulator which provides 3.2volt to the controller.

Referring to Fig-3, which shows different components connected to the controller like LCD, 4x3 keypad, buzzer, relay section, etc. There are some sensors connected like alcohol sensor, temperature sensor, accelerometer, IR sensor, etc. Also GPS & GSM are connected to controller through RS232.Crystal oscillator of 12 MHz is to connected to the pins XTAL 1 and 2.

### D. Software Explanation

For programming of the system we used keil3 software, so that we can program the controller in the C language, and for downloading of the code to the controller Flash Magic software is used.

The flowchart of system is shown in Fig-4 which follows the different conditions, and systems reaction according to

those conditions.

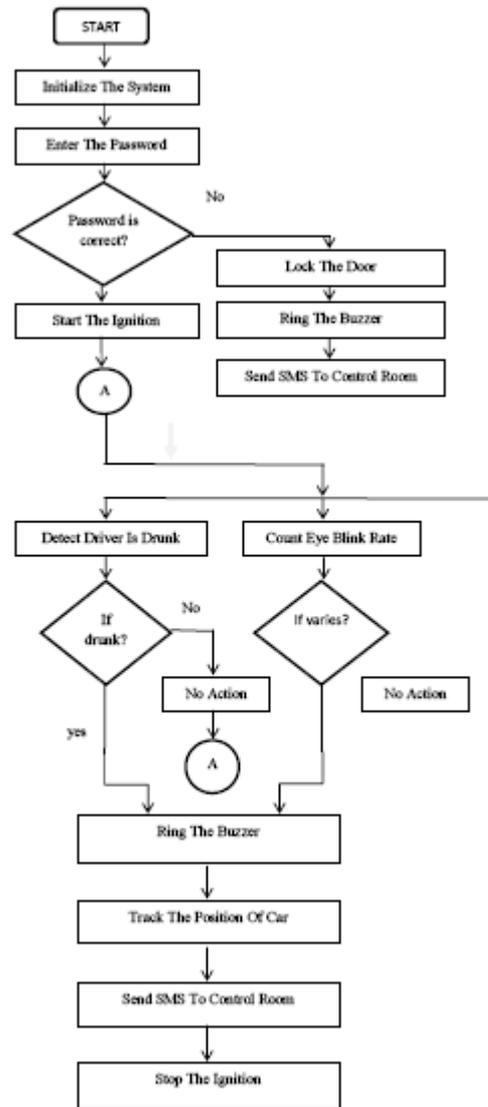
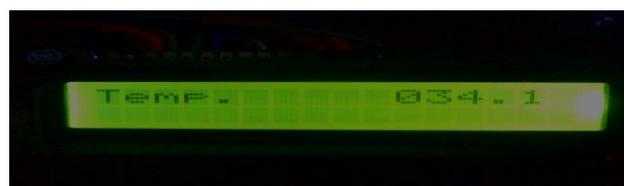


Fig.4-Flowchart

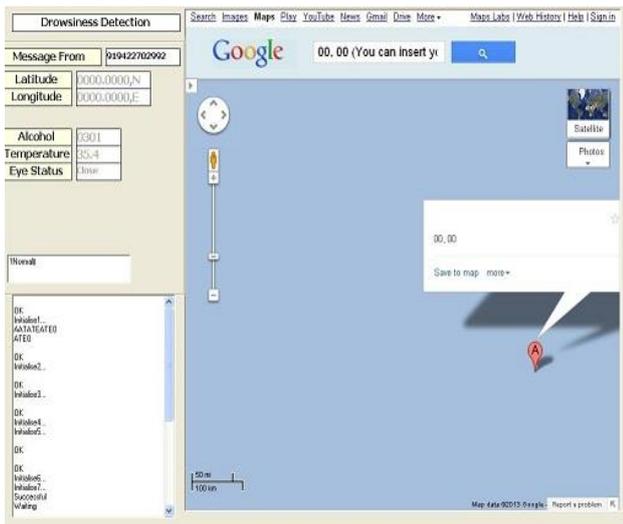
### E. Results

As soon as system gets turned ON, it starts gathering readings from different sensors such as alcohol sensor, temperature sensor and accelerometer. All those readings then displayed on the LCD along with GPS co-ordinates. The various results that we observed on display are as shown below:





All observed readings are put in a message box and sent to the control room via GSM modem. These readings are then displayed on computer window which is designed by using the Visual Basic 6.0 software. Figure below shows the screenshot of the computer window.



### III. SOME COMMON MISTAKES

Some of the common mistakes we had are like short circuiting the controller's pins while taking practical readings, transformer burns due to improper connections, etc. Initial mistakes we had like PCB track width exceeds than expected values, component soldering, etc.

### IV. CONCLUSION

The analysis and design of drowsy driving detection system is presented. The proposed system is used to avoid various road accidents caused by drowsy driving and alcohol consumption. Also this system used for security purpose of a driver.

The system will sense and measure different parameters like alcohol concentration in human/driver body, head tilt position of driver, vehicle temperature, along with the GPS co-ordinates of the vehicle.

The above measured parameter helps for security purpose of driver and to track the exact position of vehicle on the GOOGLE map.

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