DROWSINESS DETECTION MULTITASKING SMART VEHICLE SAFETY SYSTEM AT LOW BUDGET

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ABSTRACT

Drowsiness and drunken driving causes the vehicle accidents. This project proposes a real time detection of driver's drowsiness as well as alcohol intoxication, gas sensor, shock alarm sensor, vehicle detection sensor, GSM module, GPS tracking and subsequently alerting them. If any case of accident or emergency vehicle owner registered mobile number got alert messages and then we can take action immediately. Drowsiness detection multitasking smart vehicle safety system at low budget is not only drowsiness detection but also provide security or prevention of any emergency.

This paper is about making cars more intelligent and interactive which may notify or resist user under unacceptable conditions, they may provide critical information of real time situations to rescue or police or owner himself. Driver fatigue resulting from sleep deprivation or sleep disorders is an important factor in the increasing number of accidents on today's roads. In this paper, we describe a real-time safety or protection system. The purpose of such model is to advance a system to detect fatigue symptoms in drivers and indicate to avoid accidents. In this paper, we propose a driver drowsiness detection system in which sensor like eye blink sensor are used for detecting drowsiness of driver .If the driver is found to have sleep, buzzer will start buzzing and also show on LCD display . We are making this project at affordable price. And this system have multi-tasking feature, this system provide prevention from not only drowsiness and drunken driver but also safety with different-different types of accidents. This project is easy for learning and also for maintenance.

KEYWORDS:- Multitasking, low cost, smart vehicle, all types of safety, maximum task, Arduino programming, compiling, uploading, Comparison .

I. INTRODUCTION

This system provides us smart accidents prevention or multitasking system. In this paper we can detect driver drowsiness, alcohol detection, and gas detection, engine over heat, other vehicle detection and also real time vehicle tracking information when any accidents occurred. We have made this project with Arduino programming, arduino nano and different – different types of sensors. We have made multitasking vehicle security real time awareness system. This project help us for prevention many types of accidents in vehicles. This system is easy for making and repairing purposes also. These project programs compiles and upload with arduino 1.8.5 software. In our vehicle, we need many types of security awareness system for protecting accidents. But in present times there is no such precautions features available at vehicles. So that we can in-build drowsiness detection multitasking smart vehicle safety system at vehicles and then we can protect our vehicle from any types of accidents. We need only 5 volt power supply for this system and this power supply, we can get with ease from vehicle battery.

II. PROBLEM IDENTIFICATION

Drowsy while driving is now being a common issue among all drivers. As this is a very insidious problem, many people have been executed or harmed during crashes related to drowsy, heavy-eyed or exhausted conditions. And also other type of accidents occurred in vehicle and their solutions like smoke or fire detection, engine heat detection, other vehicle distance measurement, or real time vehicle owner information. The officials won't come to know the authentic facts since no one would be aware of when a motorist experiences sleepiness. Often the driver will not admit that he felt drowsy to evade being liable. Also, if the driver can't disclose anything before he/she dies, then we can't know how the crash occurred. And also we can't get real time information. It has proved from different studies that the main two risky behaviors' are sleepy driving and drunk driving, which are interrelated to a reasonable rise in accidents these days. So this type of problem we are facing in present times and we can solve this problem with our system; "Drowsiness detection multitasking smart vehicle safety system at low budget". This system provide us drowsiness alert and also multi-tasking security sensors like obstacle , shock sensor, alcohol sensor, heat sensor, gas and fire sensor. These sensors help us to provide a complete vehicle safety features.

III. LITERATURE REVIEW

We have study last few years' papers and development on driver drowsiness detection system and smart vehicle security system. But these systems are creating only one to five tasks maximum and also maximum system required high cost. So that we want to make low budget multitasking high security drowsiness detection system. In this system required minimum cost, for making and repairing also. Last few years papers, maximum papers depend upon only drowsiness detection in different-different methods. As like camera mounting with raspberry pi, ECG and EEG sensor, face detection method, vehicle starring movement recognizer etc…But in our system we are making driver drowsiness detection with eye blink (IR) sensor. And also many other sensors have included in our device. We are making total 10 types of task complete with this device. All sensors and parts are easily available in market place.

IV. BLOCK DIAGRAM

V. MATERIAL REQUIRED

5.1 HARDWARE

1. Arduino Nano.
2. HC-SR04.
3. Shock sensor.
4. Heat sensor (LM- 35).
5. IR module (Eye blink)
6. LCD display 16×2
7. MQ-2
8. MQ-3

9. GSM module.

10. GPS module.

11. I2C module.

11. Power supply adapter 5 volt 2 AMP.

12. 0 PCB.

13. 10kΩ, 1kΩ, 220kΩ.

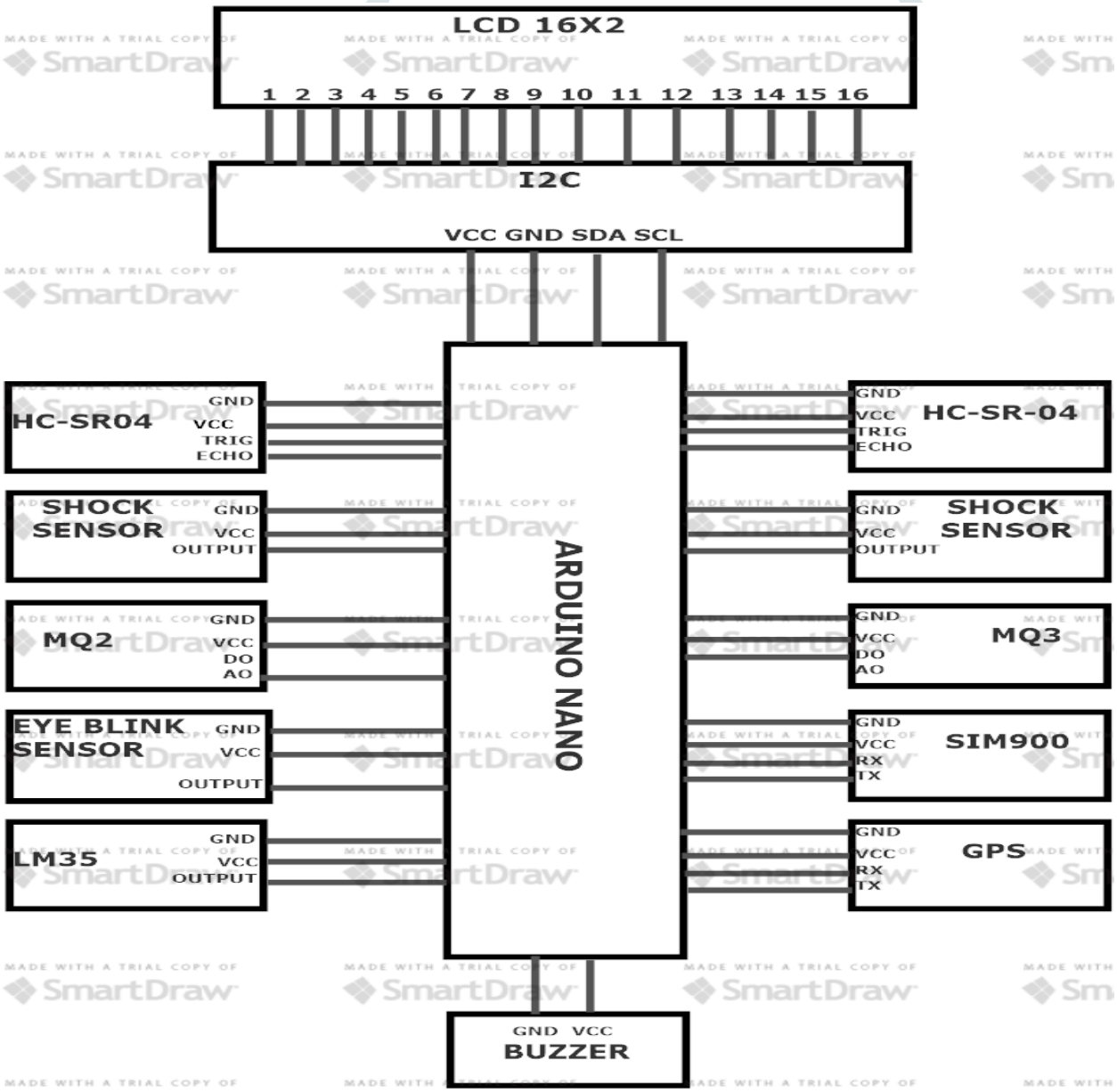
14. Connecting wires.

5.2 SOFTWARE

1. "C" coding (assembly language)

2. Arduino 1.8.5 32 or 62 bit desktop software

VI. WORKING PROCEDURE



6.1 CIRCUIT DIAGRAM

6.2 CIRCUIT EXPLANATION

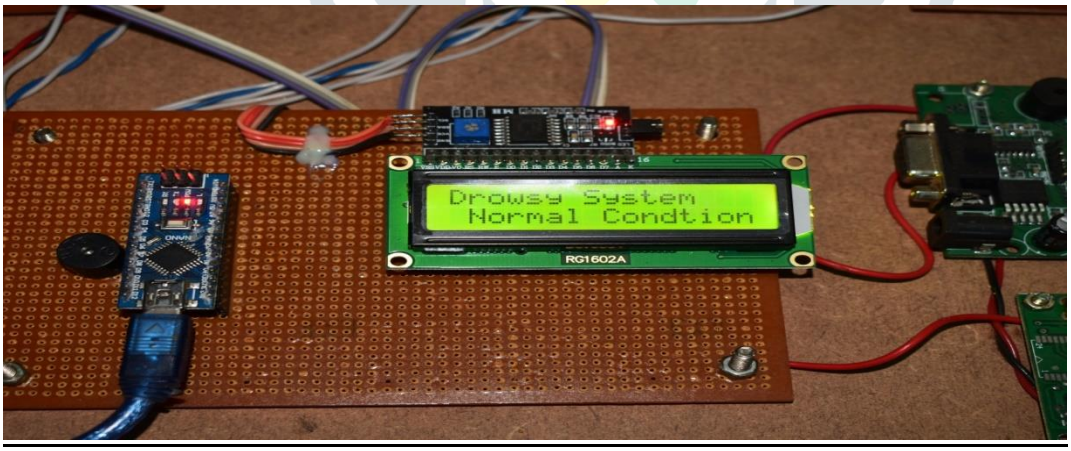
The goals of this propose design is to detect drowsiness in drivers to prevent accidents and to improve safety on the High ways also for commercial and personal use. A method for detecting driver drowsiness/sleepiness is developed on Arduino microcontroller board based on Atmega 328P for real-time monitoring. Block diagram above gives a picture of the driver drowsiness detection with multitasking system. This system enlightens the importance of safety while driving a vehicle. It comes up with a driver monitoring system which is looked after by an eye blink sensor, an alcohol sensor, gas sensor, shock sensor, GSM, GPS and obstacle sensor. GSM module transmits a signal to a registered cell phone when any emergency is prompted. The distinctive signals from each sensor are collated by means of Atmega 328P microcontroller in an Arduino based platform for faster sensor signal processing. The LCD display put on a view of the major output details of each sensor. When the set values become distorted the microcontroller initiates a signal to the alarm unit which in turn alerts the driver to wake up. The main intention of this project is to provide driver safeness during highway and long driving conditions. We have study various types of papers on Drowsy detection and vehicle safety system, But this system is better, advanced and cheaper than other system. In this system start from, when key is attached and turn on vehicle. Then our device will automatically turn on and start working. Firstly analyze sensors from Atmega 328P microcontroller. One by one each sensor on and give feedback to microcontroller.

Alcohol sensor is sense percentage of alcohol gas from environment in front of driver, if found than vehicle will turn off. When mq-3 sensor found 0% of alcohol gas then vehicle will turn on and start another sensor work properly. HC-SR04 sensor transmit signal at 37 KHz and calculate obstacle object distance < 5 meter. When this sensor found any other vehicle to both side of our vehicle, So HC-SR04 sensor gives alert via LCD display or buzzer with the help of microcontroller. We use in this system GSM and GPS module for location tracking of vehicle. But also use for alerting owner via SMS, if any type of accident create. We use heat sensor to observe engine heat and alert to driver via LCD display. We have placed shock sensor to both side of vehicle for any case of accident and alert to vehicle owner via GSM module. That all sensors we use is easily available on market and also we can get minimum amount to pay for that. Cost effective multi-tasking Drowsy detection system is better than other drowsy systems. We have MQ-2 sensor for sense smoke level at vehicle, when any passenger smoke at vehicle than our system is alerting us from LCD display or buzzer.

VII. METHADOLOGY

7.1 DESCRIBE EACH STEP WITH IMAGES

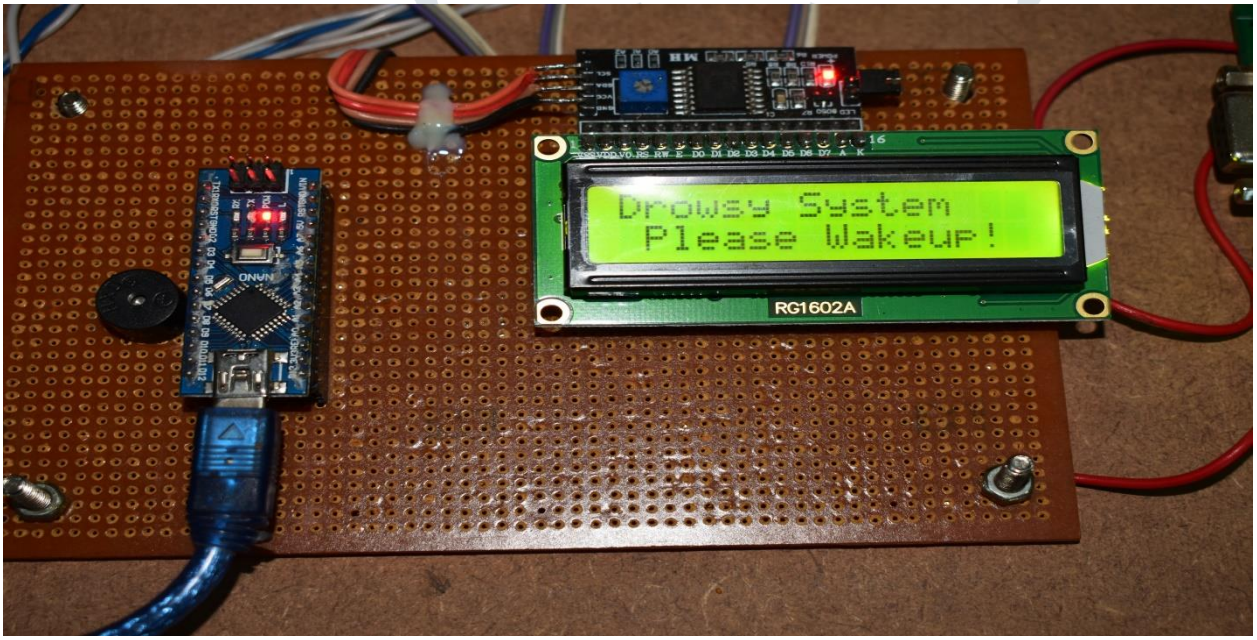
1... When we start our vehicle than we found our system display in normal condition, means all safety sensors normal and we can drive our vehicle.



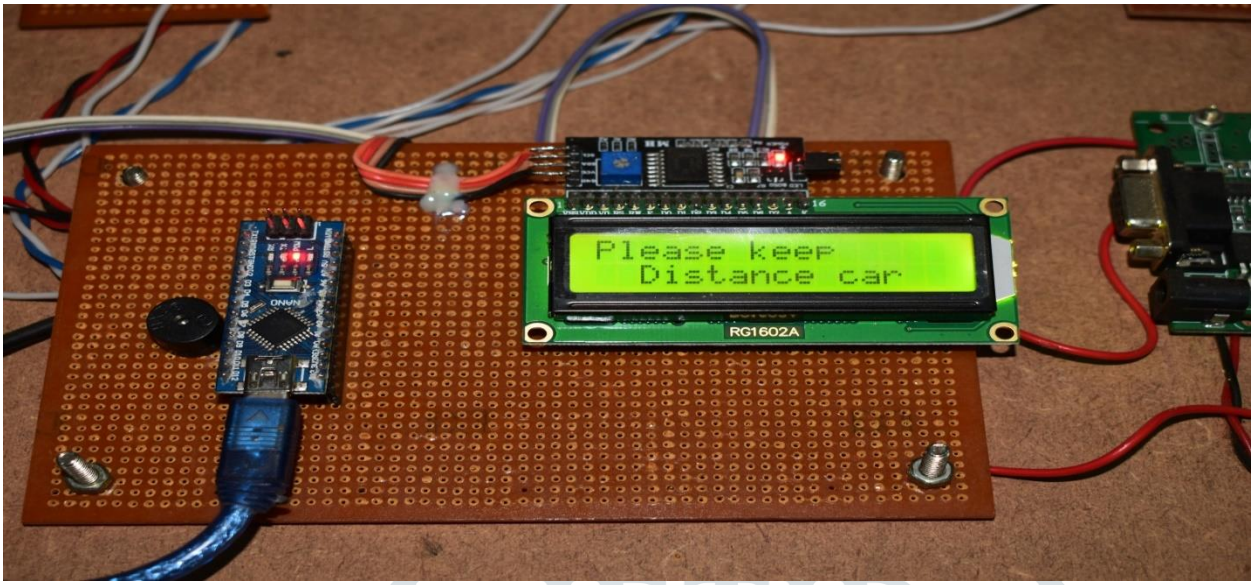
When any sensor is high or system detect any type of accident, then our system will inform us with buzzer alarm or LCD display.

2… when alcohol dissolved in air with some % detect by MQ3 sensor then we get alcohol detection information and buzzer output also. We can also update this system with auto ignition locking system.

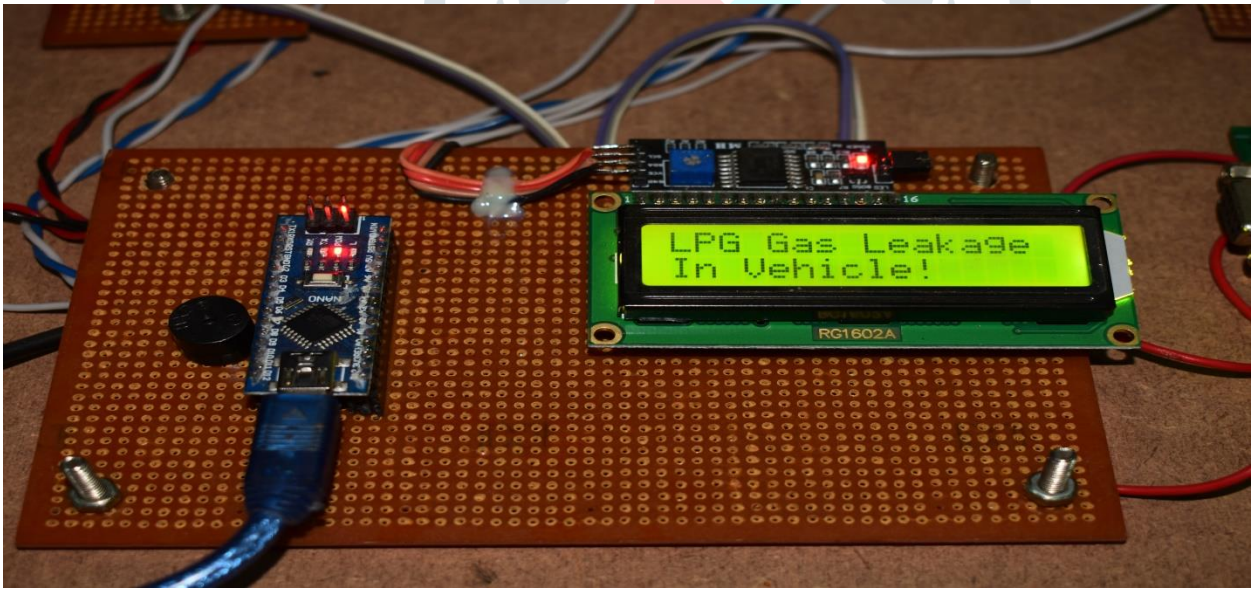
3… When system found drivers drowsiness with help of eye blink sensor, than we get buzzer alarm for awareness of driver and also LCD display msg.



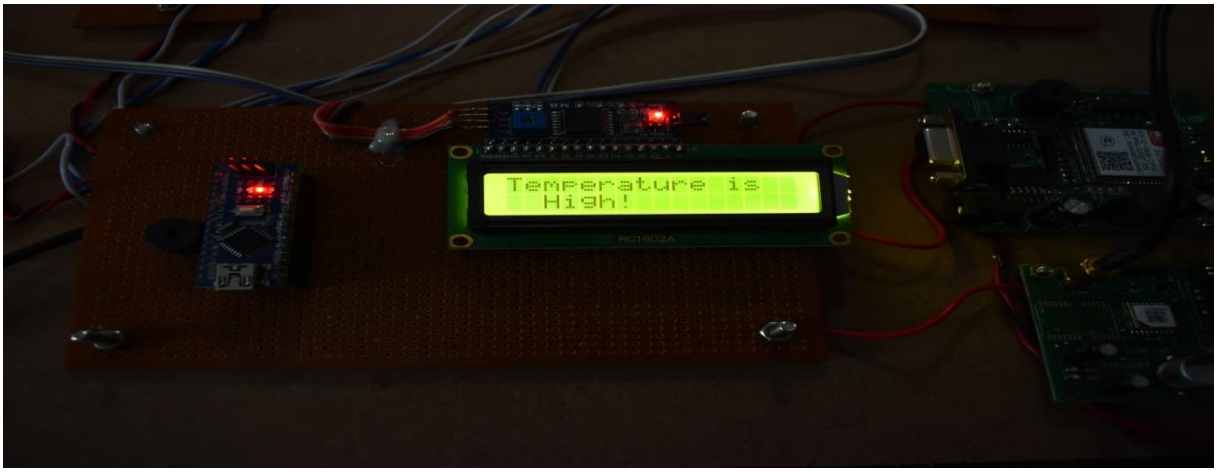
4… when we are driving and that time any other vehicle is coming our vehicle side and we set program minimum distance of any other vehicle to both side, front and back also. So that we can get keep distance message from ultrasonic HCSR-04 SENSOR.



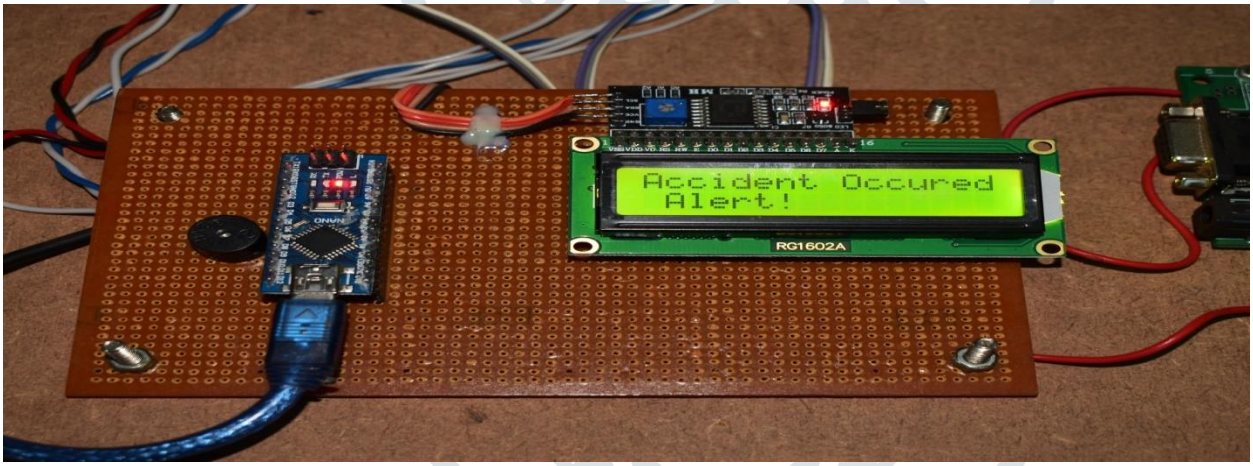
5… when our system found any type of LPG gas leakage, fire or smoke detect with help of MQ2 sensor then our system gives output for passengers awareness with help of buzzer and LCD display.

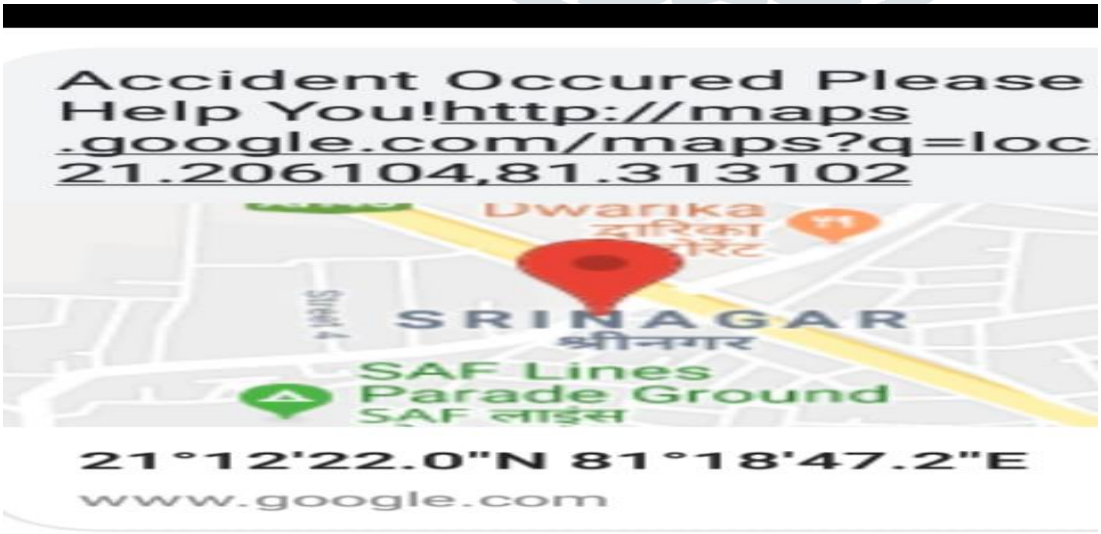


6… In this figure we can see temperature sensor output, this system help us to provide engine overheat alarm with LM35 sensor.



7… In our system we have also include accident awareness program with real time vehicle owner information and also buzzer and LCD display output. We can use piezoelectric or shock sensor for this task.





VIII. ADVANTAGES & APPLICATIONS

This project helps us to protect accidents in vehicles. We have made multitasking accidents awareness' system, also use different-different types of sensors to prevention from accidents. We can easily program, compile and upload this system with help of Arduino 1.8.5 software. In this project we can also know vehicle location when any accidents occurred. This project is easy for making and maintenance also. We can use this system for personal cars, buses, trucks, taxi, electric vehicles etc. this system installation is also easy for everyone. This system all sensors and others parts is easily available in market place. In this system we are using 8 types of sensor for making multitasking security system, but we can also include more sensors as required or if you want. We need 5 volt 2 amp power supplies for this system and this power supply obtained by vehicles battery.

IX. CONCLUSION AND FUTURE SCOPE

In this paper we have seen the system designed to reduce accidents caused due to a drowsy driver or drunken driver also for other security awareness. So it helps in saving many lives and as the status of the driver is being updated in a local server, it can be verified from time to time to know the status or condition of the driver. In future terms, Drowsy driver alert system can be implemented in aero planes to alert the pilot if he faces any abnormal condition is detected.

The project is successfully designed and tested. The objectives of the project are satisfactorily realized and completed. Following are the major results obtained.

This system is designed the protection or prevention of vehicles from theft and other hostile conditions, this becomes an important process due to insecure environment and accidents. In this system we have automatic locking of vehicles on the alcohol detection and other multi-tasking features.

An efficient smart vehicle system has been proposed which gives good security to driving. We have done a detailed survey among the existing systems for vehicles. On the basis our analysis we are proposing smart multitasking vehicle method. The advantages of the proposed system over other methods include prevention of accidental injuries, to improve safety of driving to discourage careless driving.

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