

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES **MOBILE PHONE AND SENSOR BASED DRUNK DRIVING DETECTION**

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ABSTRACT

In today's world, a lot of automobile accidents take place on daily basis, majority of them due to the drivers being drunk. By statistics, of least 3 people are killed every 2 hour due to drunk driving cases, thus leading to thousands of deaths each year. Drunk driving, or Driving under influence (DUI) of alcohol, has been and will be a major cause of automobile accidents throughout the entire world. So by this Project, we would like to propose an exceedingly competent system intended to detect and alert of condition of drivers, typically related to drunk driving. The system requires a smart mobile phone placed in vehicle, and specially designed hardware consisting of sensors which can be easily integrated in the car. A program will be installed on the hardware device as well as the smart mobile phone. Computations will be made based on sensor reading, and compared them with typical drunk driving values extracted from real driving tests. Once any it is found that the driver is under influence of alcohol, an alert will be automatically generated for the owner/relative and/or call the police before even the automobile starts, thus prevent the accident before it actually happens. we will also be implementing other additional features such as accident detection system, car proximity alarm and real time monitoring system. we are going to implement the detection system on android smart phone and have it tested with varied kinds of driving behaviors. Studies demonstrate that the system will be able to achieve high accuracy with efficiency.

I. INTRODUCTION

Propose utilizing specialized hardware with combination of smart mobile phone as the platform for drunk driving detection and other features. As per our research, this is the first time such a combined system is being implemented. Design the specialized hardware with sensors for detection drunk driving and other factors in real time. This data is then relayed to smart mobile phone. We analyze the values being generated by the sensors on the mobile smart phone and then take precautionary actions as defined. Design and implement a drunk detection system with specialized hardware and smart mobile phone. the system is reliable, non-intrusive, lightweight, and power-efficient and easily integrate able in existing as well as future cars. going to conduct real tests to assess the performance of our system. in these tests, we are going to create such environment that the values generated by sensors will vary in both positive and negative conditions. The results will indicate that our detection system will achieve excellent performance in terms of result cases such as false negative and false positive.

Implementations:

Now we are going to develop the prototype of the smart phone and sensor based drunk driving detection system on a toy car. A customized PCB will be designed as well as the android application will be created Bluetooth, GPS and GPRS as key functionalities. In the following part, we describe the implementation details of the prototype. We implement the prototype in Embedded C, Java and XML. The system can be divided into five major components: user interface, data collection system, monitoring system, data processing and alert notification. These readings are processed and used to detect drunk driving. In data processing component, according to real situations, the time windows are set to 5 seconds. When drunk driving is detected, the prevention component works to disable the ignition system of the vehicle.

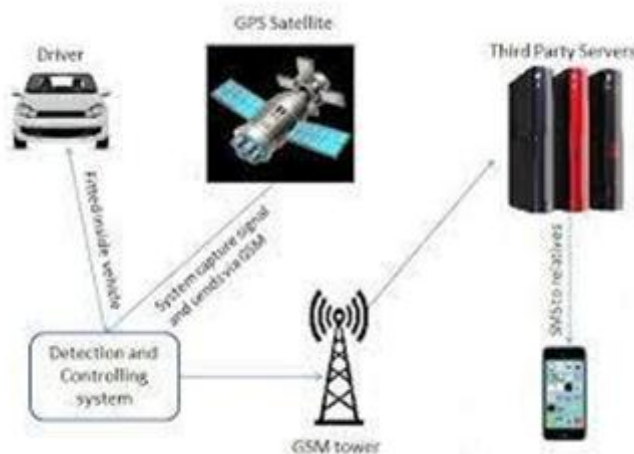


Fig.1 Components Overview and flow of system

Fig. Shows the modules(1) Custom designed hardware(2) Smart phone application for data processing and relaying,(3) Cloud server system and(4) Client side monitoring system .Drunk driving, or officially driving under the Influence(DUI) of alcohol, is a major cause of traffic accidents throughout the world.

Hardware Modules

The entire system adopted the Arduino Uno Microcontroller Board (based on ATMEGA328), the principle of the hardware chart is as shown in figure .The core function of modules are ArduinoUno, Alcohol sensor module(MQ-3) GPS Module GSM Module, 16x2 LCD Display and Dc motor.

Aurdino Uno: The aurdinobased is the central unit of the system. All the component are interfaced to the board and programmed as per their functionality to operate in synchronization.

Alcohol Module: It is used to sense the alcohol. The analog output is applied to the arduinoboard .

GSM: It is used to send an SMS to the contact of the user about the location of the vehicle. It is beneficial in emergency situation.

GPS: It is used to track the location of the user which is send via SMS through GSM module.

LCD: If alcohol is detected it helps to displays the message indicating “ALCOHOL DETECTED”.

DC Motor: It is used as a dummy for indicating the engine locking facility whenever alcohol is detected.

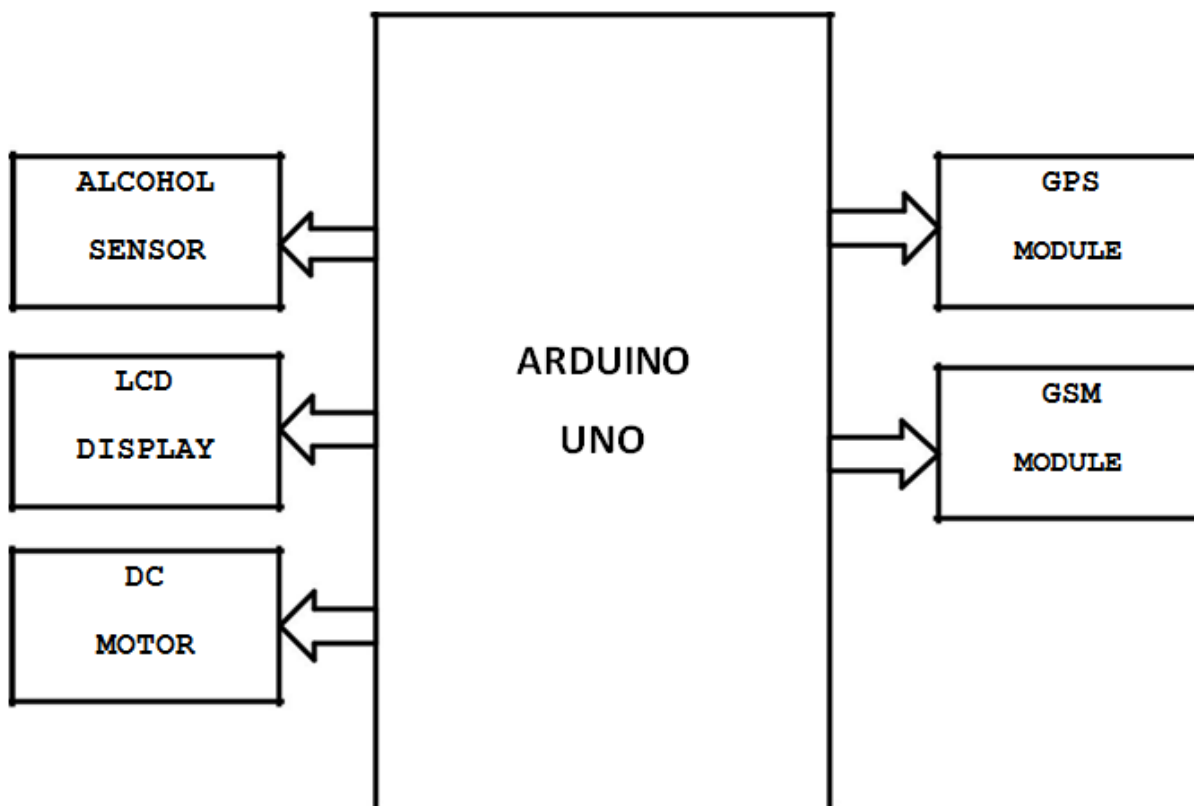


Fig: Hardware Modules

A. Arduino Microcontroller Board

Introduction: The arduinouno is the microcontroller board based on the ATmega328. It is programmable microcontroller for electromechanical device. You can connect digital and analog electronic signals:

- 1.Sensors (Gyroscope, GPS locator)
- 2.Actuators (LEDS, electrical motors)

Everything is needed to support the microcontroller, simply connect it to a computer with a it has a 14 digital input/output pins (of which 6 can be used as PWM outputs) 6 analog inputs, a 16MHz ceramic resonator,a USB connection a power jack,an ICSPs in that it does not used the FTDI USB to serial driver chip. Instead, it features at ATmega16U2header and reset button as shown in figure. It contains USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding board programmed as aUSBto-serial converter.

B. Alcohol Sensor (MQ-3)

The analog gas sensor –MQ3 Is suitable for detecting alcohol, this sensor can be used in Breathalyzer. It has high sensitivity to alcohol and small sensitivity to benzene. The sensitivity can be adjust by the potentiometer. Sensitivity material of MQ3 gas sensor is SnO₂, which with lower conductivity in clean air. When the target alcohol gas is exist, the sensor conductivity is higher along with the gas concentration rising, use of simple electro circuit, convert change of conductivity to correspond output signal of gas concentration.



Fig. Alcohol Sensor

C. GSM Module: The GSM net used by cellphones provides a low cost, long range, wireless communication channel for application that needs conductivity rather than high data rates. Machineries such as industrial refrigerators and freezers, HVAC, vending machines could being benefits from being connected to a GSM system.



Fig: GSM module

The Global Positioning System is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the earth where there is an unobstructed line of sight to four or more GPS satellites. the system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver an example of which is as shown in figure

GPS may be able to answer:

The roads or paths available, traffic congestion and alternative routes, roads or paths that might be taken to get the destination.

- If some roads are busy (now or historical) the best route to take.
- The location of food, hotels, fuel, airport or other places of interest.
- The shortest route between the locations
- The different options to drive on highway or back roads

Other GPS devices need to be connected to a computer in order to work. This computer can be a home computer, laptop, PDA, digital cameras, or smart phones. Depending on the type of computers and available connectors, connections can be made through a serial or USB cable, as well as Bluetooth, compact flash, newer express card.

Liquid Crystal Display:

LCD (Liquid Crystal Display) screen is a electronics display module and find a wide range of application. A 16x2 LCD display is very basic module and use in various device and circuits. This module is preferred over seven segment LEDs and multi segment LEDs. The reasons being LCDs are economical; easily programmable; have no limitations of displaying special and seven custom characters (unlike in seven segment), animation and so on. A 16X2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each characters is displayed in 5x7 pixel matrix. This LCD has two registers, namely, command, and data.

The command register stores the command instruction given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position controlling the display etc. The data register stores the data to be displayed on LCD. The typical LCD is as shown in fig



Fig : Liquid Crystal Display:

II. CONCLUSION:

Thus we would like to present a highly efficient smart mobile phone sensor based drunk driving detection system via this system. The hardware as well as the smart phones, which will be placed in the vehicle, will collect and analyse the data from the specialized sensor to detect if any vibrations such as driving under the alcohol influence are detected. We expect the system to present solution that observes very low false positive and false negative rates, accurate evaluations

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