

Driver Safety with Smart Alcohol Detection and Control System

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Abstract: The aim of our research paper is to represent our project which makes human driving safer and to overcome accidents. This project is developed by integrating alcohol sensor with Arduino board. Arduino processor OR NodeMCU handle more functions than conventional microcontrollers. The alcohol sensor used in this project is MQ3 which 10 detect the alcohol content in human breath. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. This project is fitted inside the vehicle. The project is designed for the safety of people sitting inside the vehicle.

Keywords: IOT Safe driver, MQ3 sensor, IOT Vehicle control.

1. INTRODUCTION

Drinking and driving is already a serious public health problem, which is likely to emerge as one of the most significant problems in near future. The system implemented by us aims at reducing the road accident in the near future due to drunk and drive. This paper presents the progress in using the alcohol detector, a device that senses a change in the alcoholic gas content of the surrounding air. This device is more commonly referred to as a breath analysis, as it analyzes the alcohol content from person's breath. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle. This paper presents the progress in using an alcohol detector, a device that senses a change in the alcoholic gas content of the surrounding air. The sensor will then analyze the amount of alcoholic vapors and offer the user some indication of the amount of alcohol present.

1.1 Problem Statement:

Road safety has always been in the center of attention. The signboards, direction arrows and lanes have made following rules much easier and served as an excellent guide, nevertheless, uncontrollable factors such as drunken drivers exist and thus accidents still happen. In the United States of America alone and during 2014 nearly "9,967 people died of alcohol-impaired-driving", that is one alcohol-impaired-driving fatality every 53 minutes. The list goes on and on for other countries too, therefore it is necessary to enhance and improvise new techniques. This project pushes towards the public safety in general and road safety in particular. The idea is characterized by being deliberately dependent on personal contribution. The system should make a significant leap in terms of public awareness in addition to the reduction of accidents caused by drunken drivers.

1.2 Existing System:

The manual detection device that cops use, do analyze the breath and detect the alcohol consumption and penalize the defaulting drivers but then it becomes increasingly impossible for the traffic-cops to control, measure and monitor the vehicle movement given the size of modern-day traffic. It therefore becomes imperative for government-authorities to take advantage of the growing-technology prevents such accidents and possibly prevent drunken-driving.

1.3 Motivation:

To save human being and avoid the accident just because of drunken driving the vehicles, so we motivated about this solution.

2. LITERATURE SURVEY

1) Title: "INTELLIGENT ALCOHOL DETECTION SYSTEM FOR CAR"

The purpose of this project is to develop vehicle accident prevention by method of alcohol detector in an effort to reduce traffic accident cases based on driving under the influence of alcohol. This project is developed by integrating the alcohol sensor with the microcontroller 16F877A. The alcohol sensor used in this project is MQ-2 which detects the alcohol content in human breath. An ignition system which will produce spark plugs is built up as a prototype to act like the ignition starter over the vehicle's engine. The ignition system will operate based on the level of blood alcohol content (BAC) from human breaths detected by alcohol sensor. The main purpose behind this project is "Drunk driving detection". Now days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus Drunken driving is a major reason of accidents in almost all countries all over the world. Alcohol Detector in Car project is designed for the safety of the people seating inside the car. This project should be fitted and installed inside the vehicle.

2) Title: “Alcohol Detection System in Vehicle Using Arduino”

The aim of our research paper is to represent our project which makes human driving safer and to overcome accidents. This project is developed by integrating alcohol sensor with Arduino board. Arduino processor ATmega328 is able to handle more functions than conventional microcontrollers. The alcohol sensor used in this project is MQ3 which to detect the alcohol content in human breath. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden from the suspects. This project is fitted inside the vehicle. The project is designed for the safety of people sitting inside the vehicle.

3) Title: “Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform”

The purpose of this paper is to develop a system that captures the Iris image of the driver by detecting if the person is drunk and likewise to develop a reliable algorithm for Iris Recognition. This paper is composed of hardware and software system which focuses on the implementation of an algorithm based on Gabor Filter. The system consists of CCD Camera and Analog-to-Digital Converter, which is linked into a MATLAB program to simulate the captured image which then provides a signal going to the microcontroller and a relay circuit to manipulate the car ignition. If the MATLAB program detects that the driver is under the influence of alcohol, a bypass system follows through a password which is recognized by the MATLAB program then the car/vehicle starts.

4) Title: “Drunk-Driver Detection and Alert System (DDDAS) for Smart Vehicles”

One of the major causes of road accidents, crashes, mishaps and fatalities globally all over the world is drunk driving. Though driving under intoxication is illegal, even then people restore to such hard-core habits often. In order to combat such risky situation on road, technological innovation needs to be implemented in a cost-effective, efficient manner. This paper discusses design, development and live-performance test of the prototype of drink and drive situation detection and alert cum vehicle control system to minimize road mishaps and enhance public safety on road. It also analyses the response of breath –alcohol semiconductor sensor with respect to variation in distance from source which is critical part of system design. Based upon the recent smart gas sensing and integration of satellite and cellular wireless communication technologies, the proposed device quickly senses the drunken state of the driver during start-up/driving by estimating the equivalent breath alcohol concentration

level corresponding to the legally permissible state’s threshold blood alcohol concentration level. On detection of such situation, on-vehicle siren/audio alarm is activated to warn the persons on road and vehicle control system is triggered to lock ignition or stop the fuel inflow to the vehicle. Additionally, ‘alert SMS’ indicating drunk driver location, tracked by onboard GPS receiver, along with vehicle number is communicated remotely to authorized (family members, traffic police) mobile user using GSM cellular network to take appropriate action thereafter. The live experiment results highlighted the successful working performance of the device in-housed at the steering wheel of the vehicle with the drunk driver.

3. SYSTEM DESIGN

3.1 Proposed System:

As soon as the driver enters the key to ignite the engine the MQ3 sensor gets activated and detect the alcohol level through exhale, and if it is measured to be beyond the excessive limit, the vehicle does not start. In case, if the driver is intoxicated before but starts consuming the alcohol while on move, the sensor keeps measuring and moment the level crosses the limit, the vehicle starts slowing down and gets stationed at the detected location.

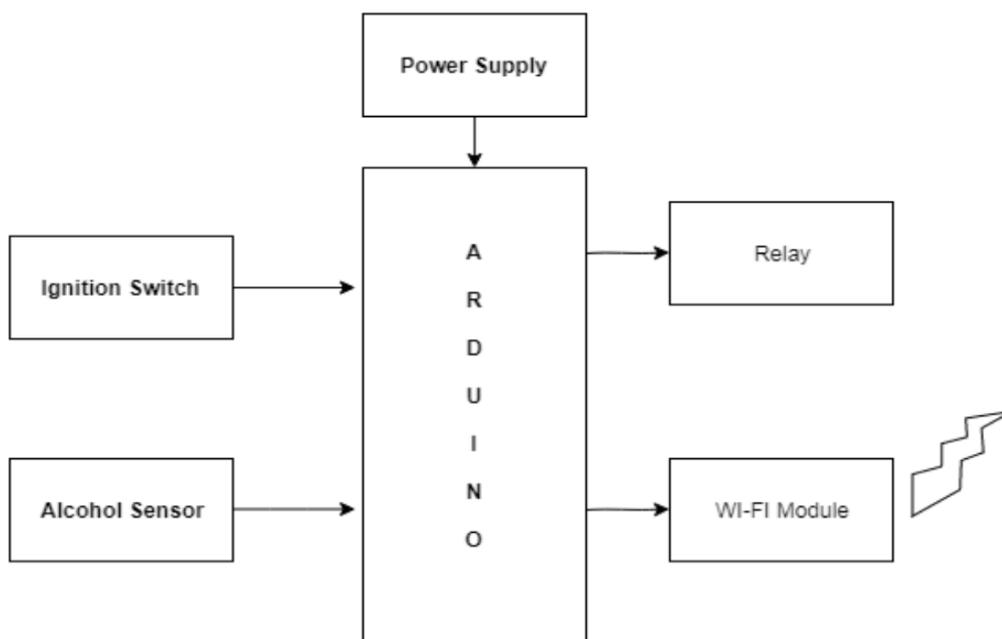


Fig: Block Diagram

As shown in the block diagram proposed system is made up of Many components

1. Microcontroller or NodeMCU
2. Ignition switch
3. Alcohol sensor
4. Relay



Fig: Alcohol (MQ3) Sensor

4. OTHER SPECIFICATIONS

4.1 Advantages:

1. To prevent accident due to drunk and driving.
2. Easy and efficient to test the alcohol content in the body.
3. Quick and accurate results.
4. Helpful for police and provides automatic safety systems for cars and other vehicles as well.
 - Safe driving: There are many accidents in which the driver often loses his precious life under the influence of alcohol.
 - Prevents traffic chaos: A person under the influence of alcohol doesn't have control over his actions as it impacts synchronized coordination of brain and body, as a result, he/she violates the traffic rules which can prove to be fatal. The proposed system takes action based on the alcohol content.
 - Compact size: Only the MQ-3 alcohol sensor has to be placed on the steering wheel and the rest of the components are hidden. The MQ3 sensor doesn't occupy more than 3 inches space.
 - Reduced number of accidents: The main focus of this system is to reduce the number of accidents due to alcohol consumption during driving. The embedded GPS alerts the registered mobile number so that action can get initiated and the victim get immediate medical attention (often the reason cited for fatality is delayed medical care).
 - Apt complementing device for cops: Every vehicle cannot be checked by the cops manually. This device can automate the process (alerts can be made to reach the local police station). Thus freeing the cops to task more important tasks such as investigation of robbery, murder and other crimes in the society.

4.2. Applications:

1. This propose system can be used in the various vehicle. For detecting whether the driver has consumed alcohol or not.
2. This project can also be used in various companies or organizations to detect alcohol consumptions of employees.
3. Public transport company.
4. Private transport companies.
5. Public Buses.
6. Governn l ent buses.
7. School, college.

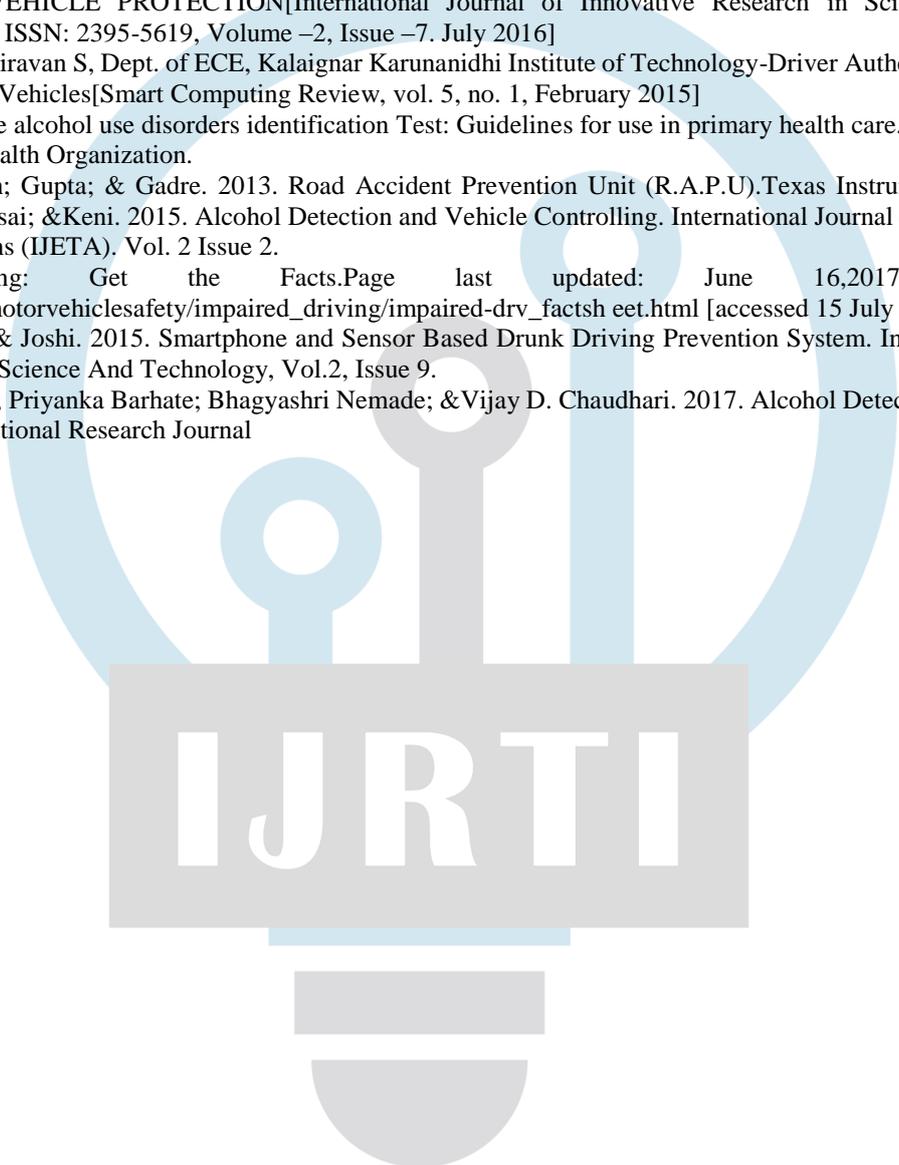
5. CONCLUSION

We have provided a very effective solution to develop an intelligent system for vehicles for alcohol detection whose core is Arduino. Since sensor has fine sensitivity range around 2 meters, it can suit to any vehicle and can easily be hidden front the suspects. The whole system has also an advantage of small volume and more reliability. As the growing public

perception is that vehicle safety is more important, advances in public safety is gaining acceptance than in the past. Future scope of this system is to control the accidents causes due to alcohol consumption. This system improves the safety of human being. And hence providing the effective development in the automobile industry regarding to reduce the accidents cause due to alcohol.

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