Alcohol detection with ignition locking system

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Abstract: *In the present day's alcohol attributed accidents are increasing rapidly. Where the concern as alcohol is a factor in many categories of injury. Every year it is found that about 2.3 million premature deaths are due to harmful consumption of alcohol. Driving while drunk is hazardous and drivers with high Blood Alcohol Content (BAC) are at expanded danger of auto crashes, roadway wounds and vehicular passing. Anticipation measures assessed incorporate permit suspension or disavowal, appropriating or seizing vehicle plates, implementing open holder bans, expanding fine punishments, imprison, ordering instruction for youth and bringing down legitimate BAC's. Despite the fact that these much obstacles made by experts to drunken drive, it is as yet proceeding with like serial scenes. In that capacity there is no viable instrument to reduce this. Here, this process is intended to plan a Drunk driving detection, which is integrated with the directing wheel. This framework is meant for making vehicle driving more secure than previously and shield the mishaps from happening due to the liquor utilization of the driver. The individual when he is at vehicle, this is necessary to infer the driver's condition continuously and here this work proposes the detection of alcohol utilizing alcohol sensor associated with Arduino.*

Alcohol sensor is installed on the steering of the car, with the end goal that when the level of liquor crosses a reasonable farthest point, where the start of vehicle will kill and the motor will stop. The Arduino always uses the alcohol sensor information to check drunk driving and works a bolt on the vehicle motor to stop the engine.

1. Introduction:

These days, majority of road accidents are caused by drink-driving. Drunken drivers are in an unstable condition and so, rash decisions are made on the highway which endangers the lives of road users, the driver inclusive. The enormity of this problem transcends race or boundary. In India, the problem is being tackled by issuing laws prohibiting the act of drivers getting drunk before or while driving as well as delegating law enforcements agents to arrest and punish the culprits. However, effective monitoring of drunken drivers is a challenge to the policemen and road safety officers. This limited ability of law enforcement agents undermines every manual effort aimed at curbing drink-driving.

Ministry of Statistics and Programme Implementation reported 11,363 road accidents in 2016. Although the report stated speed violation as the foremost cause of these accidents, it can safely be inferred that most of the cases would have been due to driver's unstable condition caused by drivers getting drunk before they drive. The investigation done by the World Health Organization in 2008 shows that about 50%-60% of traffic accidents are related to drink-driving. More so, WHO data on road traffic deaths revealed 1.25 million traffic deaths were recorded globally. Data collected showed that 67.2% of commercial vehicles drivers in India admitted to drinking alcohol during working days. This shows that most drivers, especially commercial and heavy-duty trucks drivers engage in drink-driving, which can lead to accident. India sets a legal limit of 30 g/100mL Blood Alcohol Concentration (BAC), any level above that is said to be illegal.

The BAC depicts the quantity of alcohol in a certain volume of blood. It is measured as either gram of ethanol per decilitre of blood (g/dl, commonly used in the United States), or milligram per litre of blood, (mg/l, used in much of Indian Subcontinent). For BAC level from 0.4 to 0.6, drivers feel dazed/confused or otherwise disoriented, and it is generally not safe for a driver to drive a vehicle under such condition. Also, BAC level for 0.7 to 0.8 makes a driver's mental, physical and sensory functions to be severely impaired. At this stage, a driver is inactive and incapable of driving. BAC level of 0.2 to 0.3 is still not safe but the driver still has a little degree of self-control.

Our system, will integrate the following hardware components in the design: An LCD, the MQ-3 alcohol sensor, DC motor, Buzzer and LED's integrated to ATmega328 microcontroller. The system will be designed and simulated using Proteus VSM simulator. The software code to be burnt into the Arduino board will be written in Arduino IDE sketch.

Delhi ranks first in the number of total accidents and this should be taken care of effectively and there is therefore the need for an automatic alcohol detection system that can function without the restriction of age-old breath analysing devices.

The project shall be installed inside the vehicle. Now a day's most of the peoples use cell phone for communication. Controlling devices through wireless media becomes very popular. GSM technology is very powerful because it overcomes the limited range of infrared and radio remote controls. We run the vehicle by using wireless communication system. In this system Control section acts as transmitter we are ejecting the control signals, then the vehicle receives acts as receiver the signals, according to the signals it will give an alarm or buzzer.

Thus, the project will be designed for the safety of the people on the road and as well as in the vehicle.

2. Literature Survey:

Paper Name :Alcohol Detection of Drunk Drivers with Automatic Car Engine Locking System.

Author :Dada Emmanuel Gbenga

Paper Name :Methods Of Alcohol Measurement, Alcohol Drugs Genes and the Clinical Laboratory

Author :Das Gupta

Paper Name :Alcohol Interlock Systems in Sweden10 Years of Systematic Work
Author :Patrick Magnusson, BA, Lisa Jakobsson, Sven Hultman, MLL, MSc

Paper Name :Accident Analysis and Prevention

Author :Raquel B. De Bonia, Francisco InacioBastosa, Mauricio de Vasconcellosc,

Paper Name :Sensors and Actuators

Author :Toshihiko Nagamura, Hirofumi Tanaka, Ryuji Matsumoto

Paper Name : Drug and Alcohol Dependence

Author :M. Portmana, A. Penttilä b, J. Haukkaa, P. Erikssona,H. Alhoa,c, K. Kuoppasalmia

Paper Name :Special concern: sources of inaccuracy in breath
alcohol analysis
Author :Amitava Dasgupta

3. Proposed System:

Here we propose a framework where the individual is identified for Alcohol level in his body to stay away from accidents. Drivers will be detected before they begin their vehicle. Driver will be detected by a sensor once he is seated on the driver seat by his breath. Alcohol Sensor is put in the steering to screen the breath level if the liquor content in breath is 0.08% then car motor won't start. In this framework if the driver isn't drunk, he can drive else he cannot drive until the point that the liquor content decreases. Arduino UNO is arranged and associated with the sensor. Additionally, LCD display and one dc motor are associated. Once the setup is given power supply to it so the engine will start running. Now liquor is sprayed in it where the liquor content is over 0.08% so the LCD display will demonstrate that alcohol is detected, dc engine will stop running and ignition is also stopped. This procedure is executed same in all vehicles where the car motor will be associated with the sensor. Once the alcohol sensor detects a reading, its output will be sent to the engine, by referring the range, motor will stop

its execution. While implementing this proposed framework, it can decrease the mischances by 75% and reduce the loss of property and lives.

These are some more goals of this framework:

1. When driver is starting the car then the alcohol sensor begins detecting at the condition where vehicle speed is equivalent to zero.
2. If alcoholic driver is recognized then the ignition system will turn off and notification will be shown on LCD with alarm/buzzer.
3. A flag is set when first condition is passed without discovery of liquor.
4. If alcohol is recognized for this situation at that point signal is sent to the fuel blocker by Arduino for locking the start system. So, the driver feel's that vehicle is going to stop and after that he will place the car at proper location.

4. Architecture:
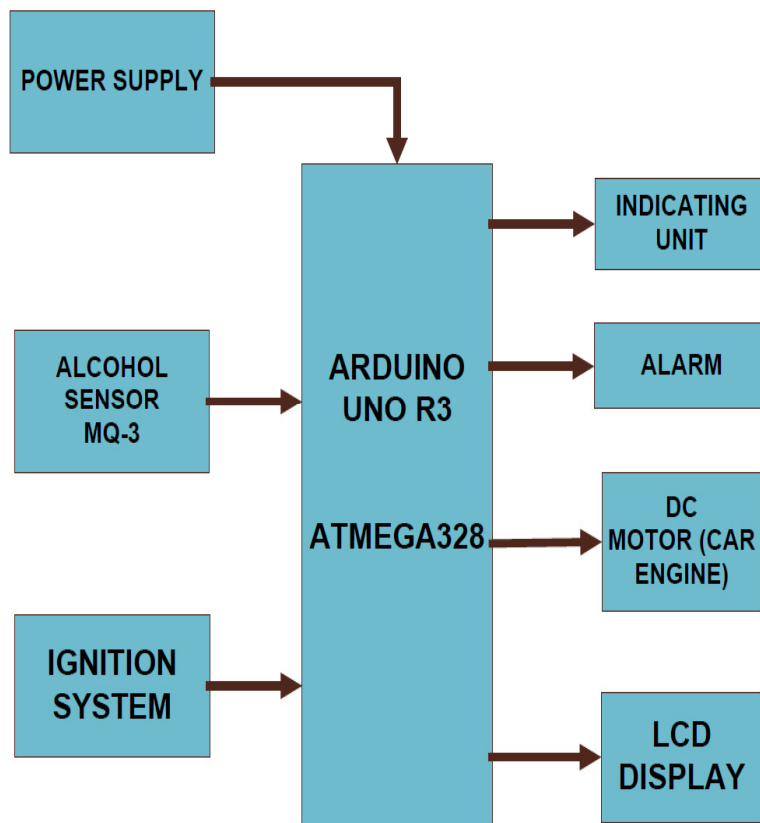
5. Algorithm:

The system algorithm comprises of three main steps. First is to boot up the system, next is the measuring state, this stage measures the amount of alcohol level from the drivers. A prescribed set limit will be given as input to the microcontroller, once the alcohol level exceeds the limit the car will not start.

STEP 1: Power on the system
STEP 2: checks for alcohol concentration
STEP 3: if alcohol is detected
STEP 3.1: turn off car engine
STEP 4: Else
STEP 5: Car engine running
STEP 6: Go to step 1

6.System Operation

The detected analogue voltage values are read by the microcontroller; the Arduino Uno board contains 8 channels, 10-bit device that changes an analogue voltage on a pin to a digital number. The system will link input voltages from 0-5V with values from 0-1023V to generate 5Vs for every 1024 units. The system will process the analogue signal and convert it to digital value of 0 or 1. Also, the analogue values from the alcohol sensor will be scaled to percentage, and this percentage is equivalent to the analogue voltage values in ppm (part per million). The first condition is the intoxication stage; the second condition is the slightly drunk stage and the last stage is drunkenness stage. Each stage will be a condition to perform a task based on the level of alcohol. In the intoxication stage, the LED indicator will be activated only, the alarm will be OFF and the car engine will be ON. In stage two, the alarm and the green LED indicator will be ON, as well as the car engine. Finally, the driver is mentally and physically inactive in stage three, so the engine will be OFF while the alarm and red LED will be ON. Therefore, once the system detect alcohol in stage three the car will be stopped and the driver can park by the roadside.

7. Conclusion:

Thus, we have proposed a method to sense the presence of alcohol from the breath of drivers and avoid the catastrophic effects it can have on people's lives. The system will be designed and implemented successfully via the use of Arduino Uno ATMEGA328 microcontroller and MQ-3 sensor. Experimental evaluation of the system will show that the alcohol sensor was able to deliver fast response when alcohol is detected. Also, the ability of the alcohol sensor to operate over a long time is an important feature of the proposed system.

The project thus gives a system that can detect a certain amount of alcohol present in the atmosphere inside the car and to a certain range and activates a microcontroller-controlled control system that controls the movement and the alarm can act as an indicator that enables a person to judge that person has taken alcohol and needs help or any assistance.

The GSM modem sends a message to the close relative or the police in order to take necessary steps to prevent any accident or necessary aids after accident.

8. REFERENCES:

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