Microprocessor and Microcontrollers
CSE2016

ALCOHOL DETECTION
REVIEW-1

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Review 1 (Literature Survey) – 10 marks - 15 days

Evaluation – 29th (Holi), 30th and 31st March 2020

1. **Base Paper - Download at least 5 Published Papers – Scopus Indexed / IEEE / ACM / Science Direct / Elsiever / T&F / TR / WoS / InderScience / companies / govt. / hack-a-thons / funding agencies / academicians**

(During CAT-I period if possible)

2. **Abstract, Conclusion, Pros and Cons, Future Work**

3. **Related Work** – idea on exploration and references for cross verification

4. **Proposed**

5. Testbed, Platform, **Tools**

6. **Data** - any dataset or real time data acquisition

7. **Mathematical Model – Formulas (either change / expand it adding new parameters / tune existing parameters)**

8. **Algorithm**

9. Cloud / database

10. Analytics

11. **User Interface – to take input or to show the results in user friendly manner**

12. Blockings – not able to understand

13. Performance Measures – Metrics

14. **Results – numbers, tables and Graphs**

15. **Comparative Analysis** of all 5 papers

16. Review Paper (combining both review-0 and review-1 content) with citations

17. Authors – Contact – Mail – Inputs – Invite (communication mail)

2.

Abstract–

The purpose of this work is to avoid drunken driving accident by using alcohol detecting sensor. The uncontrolled many accidents were happened because of influence of alcohol during driving. To avoid such accidents, we have proposed alcoholic sensor in the vehicle ignition system. This system is integrating the alcohol sensor with microcontroller, relay switch, display, GPRS and battery or it can be taking power from vehicle battery. The alcohol sensor detects the presence of alcohol content. Vehicle ignition system gets power from battery through relay switch. The ignition system will operate based on the level of Blood Alcohol Content (BAC) in human breath detected by the alcohol sensor and the signal will send to microcontroller, which will supply power to spark plug. This will inform the police/family member about the location of the Vehicle so that they can reach them and save the driver and other innocent people on road.

Introduction:

The main purpose behind this project is **“Detect Drunk Driving and prevent Road Accidents”**. Currently , most of the road accidents are happening because of drink and drive. From the figures, the more number of accidents was mainly occurred due to drunk drivers, driving under the influence of alcohol, which is responsible for about one-third of all road accidents. As a drunk person is not able to focus on driving , so he/she drive wrong side of the road , or hit the other vehicles because they don’t have any control on themselves which lead to threatening of the lives of innocent people on the road which will effect the work force of the nation. So drunk driving is a major reason of accidents in the majority countries everywhere the globe.

Alcohol Detector in automotive project is meant for the protection of the folks seating within the automotive as well as the people outside the vehicle. This project ought

to be fitted / put in within the vehicle. Drivers have the responsibility to reach their destination without endangering the lives of others as well as theirs too.

Our Project is based on detecting the alcohol and perform action according to the level of alcohol. The sensor will detect the alcohol level and check if the person can drive the vehicle or not. The result will be displayed on the display attached to the device and respective action like if allowing the person to drive the vehicle or inform someone else with their Location so they can reach to them.
It will save lives of both drunk ones and innocent ones.

Pros and Cons:

Pros

- This circuit detects the alcohol directly.
- This circuit is simple in construction.
- Readily available ICs are used.
- Responsibility of the circuit is high.
- High Accuracy.
- Low cost
- This method of analyzing or detecting the presence of alcohol in breath is relatively a quick analysis as compared to other techniques.
- The sensors used in this project are smaller in size,not so bulky.
- The project based on this technology is self sufficient within it and thus can be used as a safety system for any vehicle and, the human being driving it by preventing the accidents to occur.
- The system is not police dependent.
- In case if the driver is drunk, the family members can drive him/her safely. Also unauthorized access to the
- car and rash driving is not possible.

Cons:

- This system can be broken if the person is smart enough
- May not be effective in remote areas as there will not be enough services available for GPRS function of the device

Future Work:

As we all are expecting the future of Self driving Cars, so in future it might be not used by each and everyone , but we can expect this to be auto installed in all the vehicles so that people will not have to go somewhere else for this. As driving feature will also be there so it will be useful in those conditions.

So we can say that in future we can expect this to be automatically installed feature in future vehicles.

Conclusion:

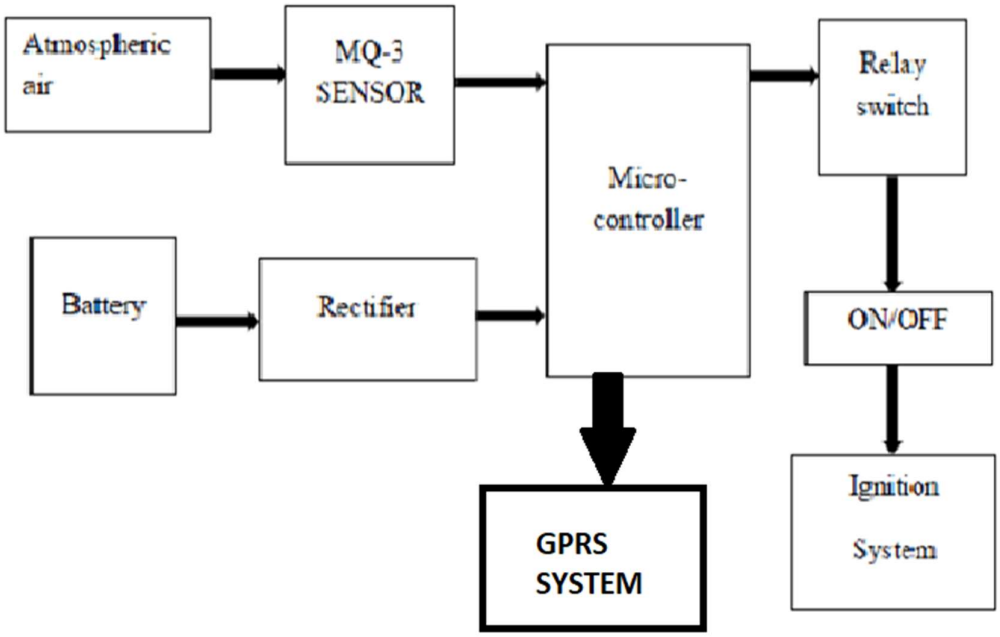
This Drunk Drive Detection system is combination of an economically effective and technology. The main unit of this project is associate “Alcohol sensor”. If the person within automobile has consumed alcohol then it's detected by the sensing element. sensing element provides this signal to a comparator IC. The output of comparator is connected to the microcontroller. We can conclude that this device will be able to reduce to Road Accidents happening because of drunk driving at a large scale.

3.Related Work

When the drunken person tries to start a vehicle, the MQ-3 sensor senses the alcohol content in the atmosphere and it sends signal to the micro-controller. Then the

micro-controller connects with relay switch which acts like remote control switch. Relays are used where it is necessary to control a circuit by a low-power signal .Also the microcontroller will inform the nearest police station or any family member/caretaker or any service providing company

4.Proposed Model



5.

PlatForm: this device can be used in all type of vehicles like Cars/trucks/mini-trucks.

Hardware used

1. **MQ-3 sensor**

Alcohol Sensor Module - MQ3. 4753. This module is made using Alcohol Gas Sensor MQ3. It is a low cost semiconductor sensor which can detect the presence of alcohol gases at concentrations from 0.05 mg/L to 10 mg/L. The sensitive material used for this sensor is SnO2, whose conductivity is lower in clean air.

2. **MICROCONTROLLER UNIT**

- The proposed system is made around **ATmega328 Arduino Uno** microcontroller board.
- The unit consists of 14 pins which allows inflow and outflow of feeding
- it is feasible to use 6 of these pins as Pulse Width Modulation signal outputs
- 6 continuous signal with time changing quantity,
- 16 megahertz electronic oscillator, a Universal Serial Bus port, an influence connector, an on-board transformer, ICSP header, and a push.

- The Atmega328 has 32 KB non-volatile storage, 2 KB SRAM and 1 KB EEPROM(electrically erasable programmable read-only memory).

3.display

a **16×2 LCD screen** can **display** up to 32 characters at once. It is possible to **display** more than 32 characters with scrolling though. The code in this article is written for **LCD's** that use the standard Hitachi HD44780 driver.

4.relay switch

Relays are the **switches** which aim at closing and opening the circuits electronically as well as electromechanically. It controls the opening and closing of the circuit contacts of an electronic circuit. When the **relay** contact is open (NO), the **relay** isn't energize with the open contact

6. Data - any dataset or real time data acquisition

- The National Crime Records Bureau (NCRB) data also shows that around 2% of the total road accidents that happen in India are due to drunk driving.

Location wise some details about drink and drive cases:

- According to data, Uttar Pradesh accounts for the highest number of drunk driving related accidents. In 2019 alone, the state has recorded 4,496 car accidents that were related to drunk driving. In 2018, the state recorded around 3,595 drunk driving related accidents
- The coastal state of Goa, also a party destination for youngsters in India, recorded one of the lowest numbers of drunk driving related accidents in the country. In 2019, the state recorded just six such incidents and in 2018, it was just eight.
- Andhra Pradesh, on the other hand, has been able to reduce the number of drunk driving related accidents significantly in 2019. The state reported over 1,300 accident cases that were related to drunk driving in 2018, it managed to bring this figure down significantly in 2019 when it recorded just 127 such cases.
- A survey in Sri Lanka indicated that for 7% of men, the amount spent on alcohol exceeded their income.

Apart from money spent on drinks, heavy drinkers may suffer other economic problems such as lower wages and lost employment opportunities, increased medical and legal expenses, and decreased eligibility for loans.

7.Mathematical Model-

To calculate BAC, the amount of alcohol in the bloodstream is measured in milligrams (mg) of alcohol per 100 milliliters (ml) of blood.

For example, a BAC of 0.10% means that an individual's blood supply contains one part alcohol for every 1,000 parts blood.

BAC	Standard Drink Equivalent
0.02%	~2 alcoholic drinks
0.05%	~3 alcoholic drinks
0.08%	~4 alcoholic drinks
0.10%	~4 alcoholic drinks
0.15%	~7 alcoholic drinks

- In the US or the UK, one can drink and drive with less than 80mg of alcohol per 100ml of blood.
- In India, the permissible **blood alcohol content** (BAC) is set at 0.03% per 100ml blood. That works out to 30mg of alcohol per 100 ml of blood.

8.Algorithm

1. Device will be placed in the vehicle at such a position that it will automatically detect the Blood Alcohol Level of the driver
2. It detect BAC using MQ3 sensor
3. It calculates the if BAC if with in permissible range
4. It will display the report formed by it to the driver

5. If the BAC lies in permissible range it will act normally
6. If BAC exceeds the limits then it will not allow the driver to start the vehicle as it will become a barrier in the circuit of ignition
7. If the vehicle is Self Driving vehicle then it will be set to Self driving mode
8. It will inform the family members/police station/caretakers or anyone whose contact would be set previously with the Location of the Vehicle so that they can come and help them and others

11. User-Interface

For input: MQ-3 sensor will automatically detect the BAC level of the driver
For output: A display will be there to display if the driver is able to drive to vehicle or not based on the input using MQ-3 sensor

14. Results – numbers, tables and Graphs

Conclusion:

This Drunk Drive Detection system is combination of an economically effective and technology. The main unit of this project is associate “Alcohol sensor”. If the person within automobile has consumed alcohol then it's detected by the sensing element. sensing element provides this signal to a comparator IC. The output of comparator is connected to the microcontroller. We can conclude that this device will be able to reduce to Road Accidents happening because of drunk driving at a large scale.

15. Comparative Analysis of all 5 papers

Paper 1 : it is mainly focusing through blocking the circuit of ignition by using relay switch if alcohol level crosses the limits

Paper 2: it is focusing on informing the police about the location of the vehicle in case the sensor detects the alcohol level crossing limits

Paper 3: focusing on reducing fuel supply if alcohol level crosses the limits

Paper 4: this one is focusing on detecting alcohol and have actions according to alcohol consumption and informing the nearby police station.

Paper 5: in this paper , The ignition system will operate based on the level of Blood Alcohol Content (BAC) in human breath detected by the alcohol sensor.

References

[1]. Road Accident Avoiding System using Drunken Sensing Technique ,Prashanth K P, Kishen Padiyar, Naveen Kumar P H, K Santhosh Kumar , ISSN: 2278-0181 Vol. 3 Issue 10, October- 2014

[2]. Avoiding Drunken Driving Road Accidents by using Alcoholic Sensors, V. Gopinath

[3]. Alcohol Detection and Automatic Drunken Drive Avoiding System Prof. P. H. Kulkarni, Ms. Ravina Wafgaonkar, Ms.Shruti S.Gujarathi, Mr. Gaurav Ahirrao Padmashree Dr. D. Y. Patil Institute of Engineering and Technology, Pimpri, Pune-18

[4]. ALCOHOL DETECTION IN VEHICLES Mrs. K. Nirosha , C. Priyanka , K.Anil Kishore *MLR Institute Of Technology, Dundigal, Telangana* e-ISSN: 2395 -0056 ,p-ISSN: 2395-0072

[5]. Alcohol Detection and Motor Locking System S. V. Altaf, Suggala. Abhinay, Ebran Ansari, Md. Kaunain, Rashid Anwer Lords Institute of Engineering and Technology, Hyderabad, Telangana, India ISSN (Print) : 2320 – 3765 ISSN (Online): 2278 – 8875