

Arduino UNO in Alcohol Detection and Engine Lock

Pooja Uday Todankar

Master of computer Applications (MCA)

Bharati Vidyapeeth Institute of Management & Information Technology

Belapur, Navi Mumbai.

Dr. Jyoti Kharade

Professor, MCA Bharti Vidyapeeth

Abstract:

In this project we are trying to help people to save their life using this tool.

This project represents a result where we try to attack the problem of loss of life and property due to drunken driving. In our project, we've used Arduino UNO microcontroller attached to an alcohol detector which detects the presence of alcohol by analysing breath of a person driving the vehicle. Machine of the vehicle is turned off and the emergency siren is blown as soon as alcohol is detected, thereby minimizing the chances of any mishaps that could have happened. Also, the system checks for drowsy driver using image processing based on Open-CV & D-lib libraries of Python and provides regional warnings as well as sends notifications to Telegram.

I. INTRODUCTION

Laziness and sleepy are the main reasons at the time of drive. sleepiness and fatigue are multidimensional quality that researchers over the past decade have establish tough to define. Indeed, it's one of the leading contributing factors in traffic accidents worldwide. Solving the problem turned critical when the design of earlier accident prevention systems was found ineffective for warning the driver. We all can be victim of sleepiness while driving, simply after too short night sleep, altered physical condition,

drinking and driving or during long travels. The sensation of sleep reduces the driver's level of alert producing dangerous situations and increases the probability of an incident of accidents

A. Aim & Objective

- To design and develop an Alcohol finding predicated Engine Lock System which has the following features
 - IP (Image Processing) for finding drowsy features using Open-CV.
 - Alcohol finding using Arduino and lock engine.
 - Audio warnings and send alert to Telegram.

II. LITERATURE SURVEY

The author has proposed a system to discover alcohol but uses GPS and GSM module which increases the overall cost which could be avoided. In our system, we are using a siren which will be further cost effective. Use of siren will wake the people around and hence any kind of necessary action can be taken.

[1] There are multiple faults with their design. A major failing is the limitation of the use to only vehicles which use helmets, i.e., 2 wheelers which is not a viable idea while driving,

especially for short distances. Another disadvantage being, the system when applied makes the helmet too heavy which is not favourable for driving.[2] The authors agitate about complex health monitoring systems and infrared sensor to turn up the presence of alcohol. A major disadvantage of this system is the possibility of a false alarm. The system is designed in a manner that indeed a slight change in some particular condition can perform in ringing false alerts indeed though everything was normal. In our system, we are using only the required technology thereby making the system more sure and cost effective when executed.[3]

A. Existing System

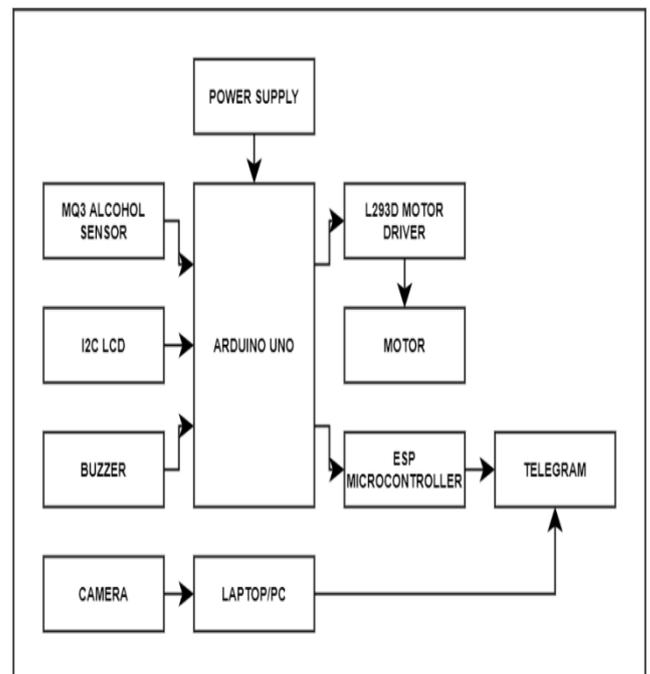
Utmost of the system studied or seen in literature review are based on image processing methodologies where a camera continuously monitors the drivers face to detect for sleepiness of fatigue. If the driver seems to be sleepy the system alerts the driver through sound. Other devices use EOG, EEG or Heart rate sensor for monitor the driver’s status and the supply alerts consequently.

III. METHODOLOGY

The Alcohol Detection and engine lock system helps to reduce accidents which are coming due to drunk and driving. The MQ-3 sensor detects the presence of alcohol in the surroundings. The detector provides result on the base of the concentration of the alcohol, if the alcohol concentration is high the conductivity of MQ-3 detector increases which in turn gives the reading to ARDIUNO. However, ARDUINO will stop the DC motor, If the reading is lesser than the threshold level. The red LED will blink if the distance is lower than the safe distance to give hint to another vehicle that the vehicle in front of them is unsafe. Now, with the help of SIM900A the message will be sent to civil forces that the particular vehicle is unsafe and can be a threat to other peoples.

A. Proposed System

1. This project uses Arduino UNO as the main microcontroller.
2. A MQ3 Alcohol sensor is used to detect whether the person driving the car has consumed alcohol.
3. If the person has drunk then the detector senses it and reports it to the Arduino.
4. The Arduino in response locks the L293D Motor Driver from operating.
5. Hence the engine is locked and also a buzzer is activated.
6. The Arduino sends a command to the ESP microcontroller to send an alert message to the person’s emergency contact over Telegram.
7. The system also comprises of drowsy driver detection using image processing.
8. Here a Laptop Camera is used for live drowsy driver detection which can be replaced by camera-based microcontroller for real use.
9. If the driver is established drowsy an audio alert is given to the user. Also, an alert is sent to Telegram.



Block Diagram

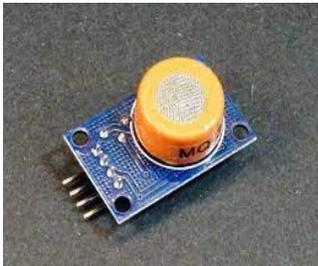
B. Hardware Implementation

1. Arduino UNO



Arduino UNO is also a low- value, flexible, and easy-to- use programmable open- supply microcontroller board which will be integrated into a spread of electronic comes. This board are associated with different Arduino boards, Arduino shields, and raspberry-Pi boards and may management relays, LEDs, servos, associated motors as an output.

2. MQ3 Alcohol Sensor



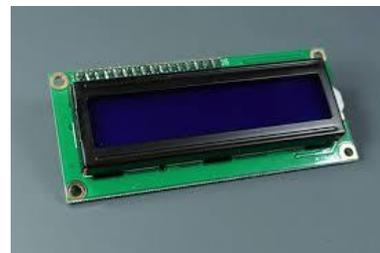
This alcohol device is appropriate for detection alcohol concentration on your breath, a touch like your common breathalyser. it is a high sensitiveness and quick latency. device provides associate Analog resistive output supported alcohol concentration

3. Buzzer



An audio signalling device form of a electronic device or buzzer is additionally mechanical device or electricity or mechanical sort. the foremost perform of this may be to convert the signal from audio to sound. Generally, it's battery-powered through DC voltage and utilized in timers, alarm devices, printers, alerts, computers, etc. supported the varied styles, it will produce totally different appears like alarm, music, bell & siren.

4. I2C LCD



The character digital display is nice for displaying text and figures and special characters. digital displays incorporate atiny low add-on circuit (backpack) mounted on the reverse of the LCD module. The module options a controller chip handling I2C messages and a flexible potentiometer for dynamical the intensity of the junction rectifier backlight. associate I2C digital display advantage is that wiring is simple, demanding solely 2 knowledge pins to control the digital display.

5. L293 Motor Driver



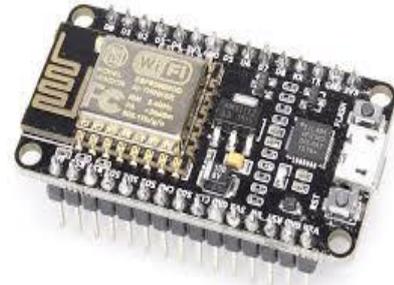
L293D Motor Driver Module is also a medium power motor driver excellent for driving DC Motors and Stepper Motors. It uses the favoured L293 motor driver IC. It will drive four DC motors on and off, or drive two DC motors with directional and speed management. the drive greatly simplifies and will increase the convenience with that you may management motors, relays etc. from micro-controllers. It will drive motors up to 12V with an entire DC current of over to 600mA. you may connect the two channels in resemblant to double the utmost current or asynchronous to double the foremost input voltage. This motor driver is good for AI and mechatronics comes for dominant motors from microcontrollers, switches, relays etc. excellent for driving DC and Stepper motors for micro-mouse, line- following robots, robot arms, etc.

5. DC Motor



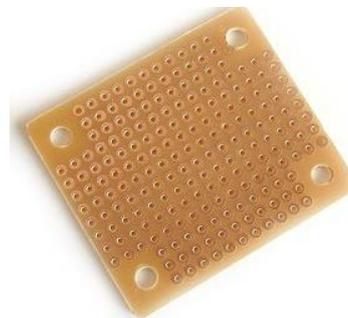
Small DC motors area unit utilised in tools, toys and totally different house appliances. In retail, the applications of DC motors embody conveyors and turntables, whereas in associate industrial setting, massive DC motor uses additionally embody swiftness and reversing applications.

6. Node MCU ESP12E Microcontroller



Node MCU is associate open supply IOT platform. It includes microcode that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and tackle that is grounded on the ESP-12 module. The term "Node MCU " by dereliction refers to the microcode rather than the event accoutrements. The microcode uses the Lua scripting language. It's grounded on the e Lua style, and erected on the Espressif Non-OS SDK for ESP8266. It uses various open- supply systems, similar as lua-cjson and SPIFFS.

7. Zero PCB



Perfboard or Zero Pcb is also a cloth for prototyping electronic circuits (also referred to as DOT PCB). it's a skinny, rigid sheet with holespre-drilled at normal intervals across a grid, typically a sq. grid of 0.1 inches (2.54 mm) spacing. These holes area unit ringed by spherical or sq. copper pads, although vacant boards are also out there. reasonable perfboard might have pads on only one aspect of the board, whereas higher quality perfboard will have pads on either aspect plate-through holes detached factors area unit soldered to

the example board like as resistors, capacitors, and integrated circuits. The substrate is usually made up of paper laminated with synthetic resin (like as FR-2) or a fiberglass- strengthened epoxy laminate (FR-4). The substrate is usually factory-made from paper laminated with rosin (similar as FR-2) or a fiberglass- supported adhesive laminate (FR-4) fiberglass- corroborated library paste laminate (FR-4)

8. Male Header



Pin headers area unit stiff bronze connectors that area unit soldered to a board and stick up to receive an affiliation from a Female socket. whereas pin headers (often referred to as pH, or headers) area unit male by description, Female equivalents are kindly common, which we tend to relate to them as Female headers (FH) or header connectors.

9. Female Header



The female connection is typically a receptacle that receives and holds the male connection.

10. Jumper Wires



Jumper cables area unit merely cables that have connection pins at every finish, permitting them to be used to connect 2 points to each alternative while not attachment. Jumper wires area unit typically used with breadboards and alternative prototyping tools thus on produce it straightforward to change a circuit as demanded.

11. Connecting Wires



Since stranded cable is a lot of versatile than solid core cable of equal size, it'll be used once the cable should move around perpetually.

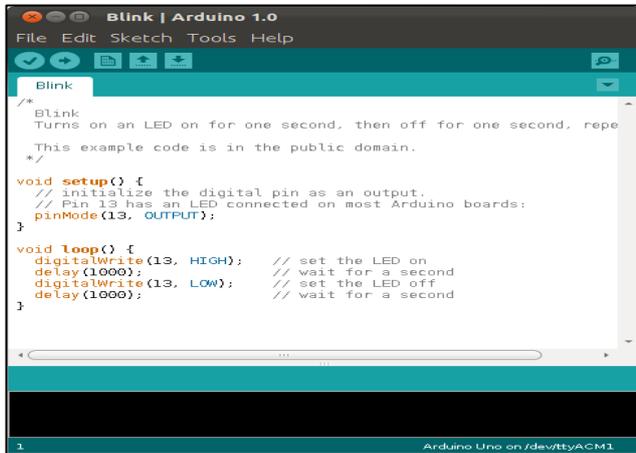
12. USB



USB stands for Universal serialized Bus. It's used as a data wire for programming equally as for provision power.

C. Software Implementation

1) Arduino IDE



The Arduino integrated development atmosphere (IDE) is a cross-platform application (for Windows, mac- Zilches, Linux) that is written among the substitute language Java. It's accustomed write and transfer programs to Arduino board. The American Standard Code for Information Interchange computer file for the IDE is discharged beneath the wildebeest General Public License, version. The Arduino IDE supports the languages C and C exploitation special rules of code structuring. The Arduino IDE provides a software system library from the Wiring project, that provides multiple common input and results procedures. The Arduino IDE employs the program to convert the feasible code into a data file in positional representation system secret writing that is loaded into the Arduino board by a loader program among the board's microcode.

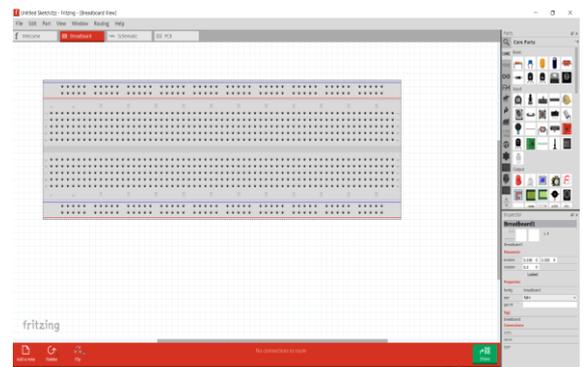
2) Telegram



Telegram may be a electronic communication app with a spotlight on speed and security, it's super-fast, easy and free. you will be ready to use Telegram on all of your devices at the identical time — your dispatches correct seamlessly across any variety of your phones, tablets or computers. Telegram has over five hundred million monthly active users and is one all told the 10 most downloaded apps among the planet.

With Telegram, you will be ready to transfer messages, pics, videos and files of any sort (doc, zip, mp3, etc), likewise as manufacture teams for over to individuals or channels for broadcasting to unlimited following. As a result, message is like SMS and mail combined — and may make certain of all of your personal or business electronic communication desires. in addition to the current, we tend to support finish-to- end encrypted voice and video calls, likewise as voice chats in teams for thousands of participators.

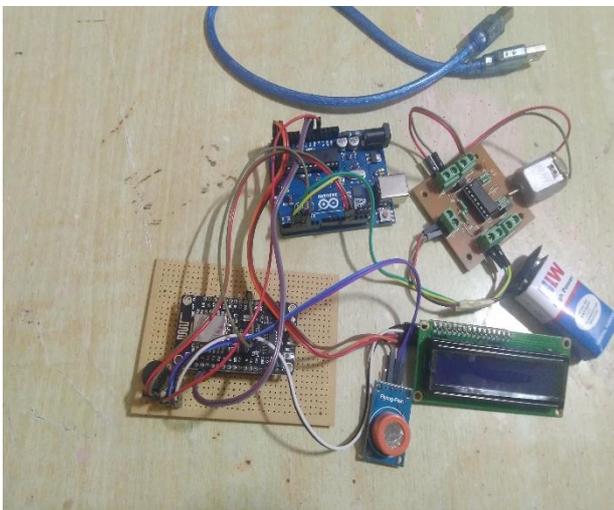
3) Fritzing



Fritzing is Associate in Nursing open- supply hardware initiative that produces natural philosophy accessible as a particular material for anyone. we offer a software system tool, a community web site and services among the spirit of process and Arduino, fostering an artless system that permits users to document their prototypes, participate them with others, educate natural philosophy throughout a room, and layout and manufacture skilled PCBs.

IV. RESULTS

If alcoholic person tries command on vehicle the alcoholic detector determines the prevailing of alcohol and close up the vehicle engine and sound alarm by that the close to individuals can exchange the seat. All stuff area unit utterly tested and connected as required thereby giving America the foremost demanded result as showed among the image below



V. FUTURE SCOPE

With road safety being utmost necessary side researchers' area unit seen visualizing however best one will offer a system that takes complete care and keeps track of drivers work. The project incorporates a good capability thanks to its

individuality as compared to the current typical systems. benefits of the model area unit listed below that makes it a wonderful device among the market.

- Maintenance value is absolutely less.
- threat of accidents reduces considerably
- It's environmentally friendly, no dangerous emissions.
- Power consumption is much lower.

VI. CONCLUSION

As the system demand and additionally the required factors are going to be effortlessly created on the market this project is applied simply. it's going to offer the safety to drivers and alter the means of their driving in addition as system. it has been given the initial style of the system with a awfully reduced value. It's dependable system with fast and easy installation. The system is also swimmingly extended. it's going to enhance system measurability and scale back accident thanks to fatigue and temporary state.

VII. REFERENCES

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