**IOSR Journal of Engineering (IOSRJEN)** **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
PP 63-67

# Automatic Breathalyzer Using Dynamic Signature

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***Abstract:*** *This paper proposes an ignition system for real time detection of driver's face recognition, finger print authentication as well as alcohol intoxication and subsequently alerting them. The main aim of this proposed system is to reduce the number of accidents due to driver's drowsiness and alcohol intake to increase the transportation safety as well as protect the vehicle from theft. This proposed system contains 8-megapixels digital USB camera, ArduinoATmega36 loaded. Face detection is the important part of this project will be done using*

***Keywords:*** *Drowsiness detection, Alcohol intoxication, face recognition, finger print authonication, Open CV, Arduino UNO and GSM.*

## I. Introduction

A smart car is one which consists of several sensors which helps the driver to analyze the driving conditions such as terrain, environment conditions and engine temperature.

These cars also have distance detection sensors to perform obstacle detection, and accelerometers for cruise control as well. Apart from this, cars also have a buttons to start the car, control the power windows, heads up display to play music and videos and the list goes on. With the dawn of Artificial Intelligence, automated cars have also gained importance [1]. Now-a-days, smart cars not only indicate luxury, but also have become a necessity. With the extreme competition between the automobile manufacturers, introducing new features in every edition of their cars has become the "success mantra". Thus, many companies and universities around the world are working day and night to introduce new traits. One such attribute, which is most explored, is enhancing the security of the car.

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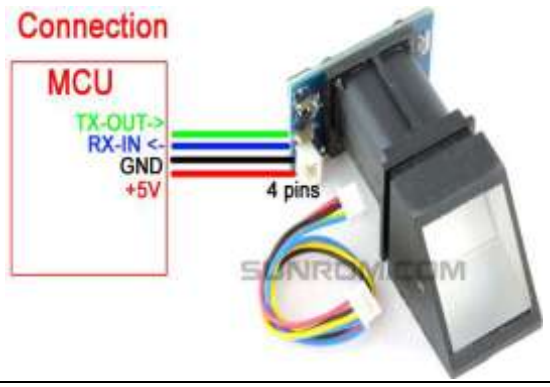
(RFID). Kill switches are push buttons usually installed below the steering wheel of the cars. These get activated when the car is locked using electronic or RFID keys and shut down the ignition system completely. Car alarm systems can detect intrusions such as vehicle glass breakage, attempts to enter without a key and vibrations near the car. Once such invasion is detected, a huge alarm/noise is raised to alert the neighborhood.



**Proposed Work**

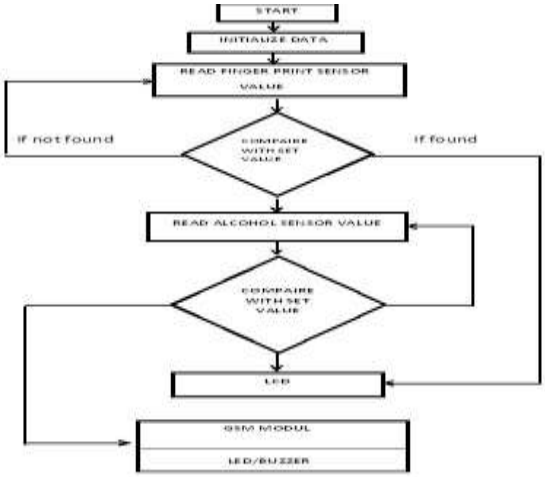



**Fig 1:** Flow chart of automatic breathalyzer using dynamic signature

**Finger Print Authentication**

The fingerprints captured for biometric use require further processing. This is not the case with those fingerprint capture for security vetting process which does not any process but saved directly into relational database together with personal details. Security vetting process requires the total in biometric system, input fingerprint image is processed to skeleton image levels and then features are extracted from the said thinned image. Biometrics fingerprint image processing (Digital image processing) stages includes fingerprint capturing, normalization, segmentation, enhancement, thinning and minutiae extraction as shown in figure

It is a well-known fact that the finger print of an individual is unique. Each print pattern includes two main features: ridges and minutia points. The former feature is found to be hereditary, thus individuals belonging to a family will have same ridge patterns.

On the other hand, minutia features consider ridge endings, bifurcation of the ridges and short ridges, which are found to be unique. Thus minutiae based matching algorithm is applied for finger print authentication.

**Fig2: Fingerprint recognition (Biometry)**

A fingerprint scanner system has two basic jobs, it needs to get an image of the finger, and it needs to determine whether the pattern of ridges and valleys in this image matches the pattern of ridges and valleys in pre-scanned images.

**Alcohol Daetection**

For the safety of the driver and passengers, an alcohol test can be performed. After two-stages, authentication of face and fingerprint recognition, the driver is requested to blow into a gas sensor. The MQ-3 gas sensor is used for alcohol detection. These are also known as Breathalyzer or Breathe content (BrAC). We can determine the driver consumed alcohol or not by the percent of BAC in blood of driver.

MQ BrAC values can be converted to

BAC.0.1% BAC = 1000 mg/L

If the sensor senses the value greater than a particular threshold, this implies that the driver is drunk. In such case, the car engine would not get ignited.

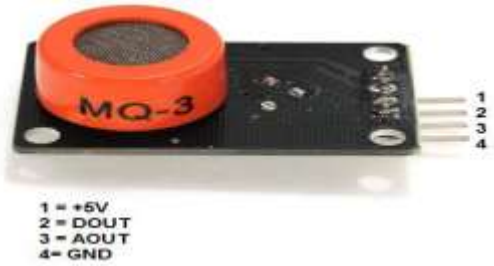



**Fig 3:** MQ-3 gas sensor

**GSM Module**

The GSM-SIM900 module uses a Subscriber Identity Module (SIM) card issued by a network provider, which offers GSM/GPRS 900/1800MHz coverage. The GSM libraries have to be attached in the program for the Arduino, so that Arduino can communicate with the GSM shield/module. Here, dual band SIM900A is utilized.

**Fig 4:** GSM Module

**Alcohol Detection**

The Alcohol sensor MQ-3 is selected in this system due to its high sensitivity in detection and has good resistance to disturb of gasoline, smoke and vapor. The sensor able to detect Blood Alcohol Content (BAC) with different concentration and classified to the range of BAC detected into a few level. Alcohol sensor MQ3 is suitable for detecting alcohol concentration just like our common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration which is given to inbuilt ADC of microcontroller.

The system begins to operate when the alcohol sensor detected BAC level from the driver. Then it will send the signal to Arduino AT mega for further process which will involve the display, alarm and ignition system. BAC level detected by alcohol sensor is based on gas/ alcohol concentration in ppm (parts per million). This system is tested by alcoholic drinks/after shave lotion as the input to the experiment. The alcohol sensor can sense an alcohol from human breath from 0 ppm until 1000 ppm. In this system is the alcoholic intoxication is displayed in the percentage, for that purpose we program as per our condition that voltage samples is converted into percentage using Mapping Concept. The result is categorized into three conditions of the driver with different value (in percentage) of BAC level which are intoxication, drunkenness and over limit drunk.

**Arduino AT mega 360**

All the sensors and modules are connected to the micro controller board. An Arduino Mega micro controller board has been employed for the work conducted [7]. This micro controller is based on the ATmega 360 processor. This has 54 input/output digital pins and 16 input/output analog pins. This houses a 16MHz crystal oscillator. Flash memory up to 256 kB is available. The experimental set up as shown in fig.


**Fig 5:** Arduino AT mega 360

## II. Result

**Fig6:** Results of automatic lbreathalyzer using dynamic signature

The prototype is successfully designed and tested. The objectives of the project are satisfactorily realized. Following are the major results obtained.
An advanced system is designed the protection of vehicles from theft and other hostile conditions becomes important due to insecure environment.

1. One level of ensuring authentication of driving is through finger print recognition system that authenticates a user being an authorized person to have access to the ignition system.
2. Real time vehicle security system based on computer vision provides a solution to this problem. The proposed vehicle security system performs image processing based real time user authentication using face detection and recognition techniques and microprocessor based control system fixed on board with the vehicle.
3. Automatic locking of vehicles on the alcohol detection.

**Future Scope**
Due to large increment in percentage of drunk and drive cases. It may be good future scope.
Ø It gives direct information of drunk person to the head office so it helps to reduced corruption so it may be a good future scope.
Ø With the help of GSM technology we can sent messages to the family members of the drunk person and automatic fine challan will be deducted.
Ø With the help of thumb scanner and adhar card information we can achieve exact identity of the drunk person
Ø In some cases the drunk person is so drunk and he is not able to tell kind of information about himself so this technique is so useful on that condition.

## III. Conclusion

The project "Automatic Breathalyzer Using Dynamic Signature" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every

module has been reasoned out and placed carefully thus contributing to the best working of the unit.Secondly, using highly advanced componants and with the help of growing technology the project has been successfully implemented.

It's really hard to calibrate this sensor for even an approximate BAC reading. It's even difficult to correlate readings to looked-up BAC values. There are many environmental factors that affect the resistance within the sensor (humidity, temperature, oxygen concentration), and this is only a $5 device anyway. And as evidenced by the lack of consistency between online BAC calculators, there's not even concensus about how to compute BAC.on actual blood tests or urinalysis for evidence.

Wireless communication industry is blossoming at a great pace. As wireless communication systems evolve, service quality and capacity are of primary importance. To ensure reliable communication over a mobile radio channel, the GSM module is used for communication a system must overcome multi path fading, polarization mismatch, and interference. The trend towards low power hand held transceivers increases all of these challenges. Keeping all the above parameters in view we have designed a low cost integrated system for monitoring the different types of parameters between two systems.

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