| **Alcohol and Accident Detection System**  **by**  SHRIKRISH S 20BRS1190  SAI TEJA BANDARU 20BRS1129  SAI VIGNESH N 20BCE1128  A project report submitted to  **Prof.Ralph Thangaraj**  **SCHOOL OF ELECTRONICS ENGINEERING**  in partial fulfilment of the requirements for the course of  **CSE2006- Microprocessor and Interfacing**    **Vandalur – Kelambakkam Road**  **Chennai – 600127**  **APRIL 2022**    **BONAFIDE CERTIFICATE**    Certified that this project report entitled **Alcohol and Accident detection system** is a bonafide work of SHRIKRISH S 20BRS1190 SAI TEJA BANDARU 20BRS1129, and SAI VIGNESH N 20BCE1128 carried out the Project work under my supervision and guidance for **CSE2006- Microprocessor and Interfacing**      **Prof.Ralph Thangaraj**  Associate Professor  School of Electronics Engineering (SENSE),  VIT University, Chennai  Chennai – 600 127.  **TABLE OF CONTENTS**   | **SERIAL NO** | **TITLE** | **PAGE NO.** | | --- | --- | --- | | i | ABSTRACT | 4 | | ii | ACKNOWLEDGEMENT | 5 | | 1 | INTRODUCTION | 6 | | 1.1 | WORKING PRINCIPLE | 6 | | 1.2 | APPLICATIONS | 7 | | 2-2.1 | BLOCK DIAGRAM | 8 | | 2.2 | FLOW CHART | 9 | | 2.3 | HARDWARE ANALYSIS | 10 | | 2.4 | SNAPSHOT OF THE CIRCUIT DIAGRAM: | 15 | | 3-3.1 | SOFTWARE –CODING AND ANALYSIS | 16 | | 3.2 | RESULT | 20 | | 4 | CONCLUSION | 25 | | 4.1 | INFERENCE | 25 | | 4.2 | FUTURE WORK | 26 | | 4.3 | COST | 26 | | 5 | REFERENCES | 27 |   **ABSTRACT**  As the usage of vehicles is increasing drastically, the hazards due to vehicles has also increased. The main cause for accidents is high speed, drunk and drive, diverting minds, over stress and due to electronic gadgets. In most cases, when an accident happens, it takes a lot of time for the families of the injured person to receive the news of the accident.  Our system senses the vehicle and whenever either the driver is drunk or doesn’t wear a seatbelt, he/she gets an indication through beep sounds. Also our system detects accidents, gets the location of the vehicle at the accident spot, and a message requesting aid will be forwarded to the rescue team whose mobile number is registered in GSM.  The main objective of our project is to protect the lives of human beings by introducing an accident alerting and reporting system to not only minimise the number of accidents by alerting the driver but also to provide quick assistance in case an accident occurs.  **ACKNOWLEDGEMENT**    We wish to express our sincere thanks and deep sense of gratitude to our project guide,**Prof.Ralph Thangaraj,** Associate Professor, School of Electronics Engineering, for her consistent encouragement and valuable guidance offered to us in a pleasant manner throughout the course of the project work.  We are extremely grateful to **Dr.GANESAN R,** Dean of School of Electronics Engineering, VIT Chennai, for extending the facilities of the School towards our project and for his unstinting support.  We express our thanks to our Head of the Department **Dr. REKHA D** for her support throughout the course of this project.  We also take this opportunity to thank all the faculty of the School for their support and their wisdom imparted to us throughout the course.  We thank our parents, family, and friends for bearing with us throughout the course of our project and for the opportunity they provided us in undergoing this course in such a prestigious institution.  **NAME WITH SIGNATURE NAME WITH SIGNATURE NAME WITH SIGNATURE**    SAI TEJA BANDARU SHRIKRISH S SAI VIGNESH N    20BRS1129 20BRS1190 20BCE1128  **INTRODUCTION:**  **1.1 WORKING PRINCIPLE:**  The Alcohol Detection with Engine Locking system helps to reduce accidents which are occurring due to drunk driving. Alcohol sensors detect the presence of alcohol in the surroundings. The sensor provides output on the basis of the concentration of the alcohol, if the alcohol concentration is higher the conductivity of the alcohol sensor increases which in turn gives the reading to ARDUINO. If the reading is greater than the threshold level, ARDUINO will stop the DC motor(car), the buzzer is turned on and a message is displayed on the LCD.  Seat belt sensor is used to detect whether the driver is wearing a seat belt or not. If a person is not wearing a seatbelt the buzzer is turned on and a message is displayed on LCD.  Accident detection and vehicle messaging systems using GSM modem helps to detect accidents by vibration sensor.  Vibration sensor (Piezo elements) comes in handy when you need to detect vibration or a knock. Can use these for tap or knock sensors pretty easily by reading the voltage on the output.  Vibration sensor helps to send the signal to the Arduino controller. Arduino controllers send the alert message to the registered users through GSM modem with location.  If the person meets a small accident, the driver can inform them that attention is not required by terminating the message using a switch.(push button).  **1.2 APPLICATION:**  The applications of this project are easily visible:  • The Alcohol detection with engine locking system can be  implemented in any 4- wheelers.  • The Alcohol detection with engine locking system can help  prevent accidents due to drunk driving.  • The Alcohol detection with engine locking system can be  very helpful for the police.  • The Alcohol detection with engine locking system prove  automatic safety system for cars and other vehicles  **2.1 BLOCK DIAGRAMS:**      **2.2 FLOW CHART:**    **2.3 HARDWARE ANALYSIS:**   * Arduino Uno ATmega328 microcontroller:     R3 Arduino Uno is a microcontroller development board that works on Atmega-328P. The arduino results to numerous various functions like Microcontroller area unit, computer circuit unit, primarily little computers that will run tiny easy software package programs, the area unit are enough low steam-powered which can steam powered by various batteries for years however area unit ready to measure information much quicker than a person’s brain can method/suppose.   * MQ-3 Alcohol sensor     The MQ-3 sensor is made of Tin Dioxide (SnO2) delicate layer. It is sorted out in such a structure to give high affectability to liquor and low affectability to Benzene. It has an immediate drive circuit to give lively reaction, quality, and longer lifetime. It has a clear interface type. On the sensor, port pins 1, 2 and 3 tends to the yield, GND and VCC independently. The MQ-3 sensor is used to detect the presence of alcohol level in the surroundings and give reading to Arduino which determines whether the consumption level is in limit or not.   * LCD   LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.   * IR Sensor(Seat Belt Sensor)     An infrared (IR) sensor is an electronic device that measures and detects infrared radiation in its surrounding environment. Infrared radiation was accidentally discovered by an astronomer named William Herchel in 1800. While measuring the temperature of each colour of light (separated by a prism), he noticed that the temperature just beyond the red light was highest. IR is invisible to the human eye, as its wavelength is longer than that of visible light (though it is still on the same electromagnetic spectrum). Anything that emits heat (everything that has a temperature above around five degrees Kelvin) gives off infrared radiation.   * Buzzer   The alarm unit used is a buzzer which indicates when alcohol is detected. The buzzer is activated when an oscillating signal is passed through the coil of the buzzer and it fluctuates the disk present in the buzzer at a particular frequency which is equal to  the driving signal. The buzzer indicates that vehicle in front of us is unsafe   * GSM Module     This is a smaller and solid remote module structure. The SIM900A is an entire group Dual-band GSM/GPRS strategy in a SMT module which can be installed in the client applications. The SIM is embedded in the SIM900A module and thewill individual that the vehicle is not safe.be sent to the cops or any specific.   * GPS Module   The Global Positioning System (GPS) is a satellite based navigation system that provides location and time information. The system is freely accessible to anyone with a GPS receiver and unobstructed line of sight to at least four of GPS satellites. A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites. GPS is nowadays widely used and also has become an integral part of smart phones.   * DC Motor     The DC motor is connected to the L293D which in turn is connected to Arduino and is given 5V supply. DC motor works on the principle of Lorentz Law. When an electric current is passed through the motor, the coil carrying the current produces   * Vibration Sensor(Accident sensor)   A vibration sensor is a device that measures the amount and frequency of vibration in a given system, machine, or piece of equipment. Those measurements can be used to detect imbalances or other issues in the asset and predict future breakdowns.  **2.4 SNAPSHOT OF THE CIRCUIT DIAGRAM:**  **SOFTWARE:**  The proposed system can be designed and simulated in the simulation software Proteus Professional 8. For coding Arduino 1.65 ® can be used.    **3.1 SOFTWARE –CODING AND ANALYSIS**  #include <LiquidCrystal.h>  #include <TinyGPS.h>  LiquidCrystal lcd(4, 5, 6, 7, 8, 9);  const int relay\_Pin = 2;  const int buzzer\_Pin = 3;  const int ir\_Sensor = 10;  const int alcohol\_Sensor = 11;  const int vibration\_Sensor = 12;  TinyGPS gps;  long lat,lon;  bool ir\_status = LOW;  bool alcohol\_Status = LOW;  bool vibration\_Status = LOW;  void setup() {  pinMode(relay\_Pin, OUTPUT);  pinMode(buzzer\_Pin, OUTPUT);  pinMode(ir\_Sensor, INPUT);  pinMode(alcohol\_Sensor, INPUT);  pinMode(vibration\_Sensor, INPUT);  Serial.begin(9600);  lcd.begin(16, 2);  lcd.print("ACCIDENT DETECTION");  lcd.setCursor(3,2);  lcd.print("SYSTEM");  }  void loop() {  ir\_status = digitalRead(ir\_Sensor);  delay(100);  if(ir\_status == HIGH)  {  digitalWrite(buzzer\_Pin, LOW);  delay(200);  lcd.clear();  lcd.print("Seat Belt");  lcd.setCursor(3,2);  lcd.print("Detected");  delay(500);    while(1)  {  alcohol\_Status = digitalRead(alcohol\_Sensor);  delay(100);  if(alcohol\_Status == LOW)  {  digitalWrite(buzzer\_Pin, LOW);  delay(200);  lcd.clear();  lcd.print("Alcohol not");  lcd.setCursor(3,2);  lcd.print("Detected");  delay(500);  digitalWrite(relay\_Pin, HIGH);  delay(200);  while(1)  {  lcd.clear();  lcd.print("Vehicle Started");  delay(500);  while(1)  {  vibration\_Status = digitalRead(vibration\_Sensor);  delay(100);  if(vibration\_Status == HIGH)  {  lcd.clear();  lcd.print("Accident Detected");  lcd.setCursor(3,2);  lcd.print("Sending Msg");  digitalWrite(relay\_Pin, LOW);  delay(500);  Serial.println("AT+CMGF=1"); //Sets the GSM Module in Text Mode  delay(100); // Delay of 1000 milliseconds or 1 second  Serial.println("AT+CMGS=\"+919922512017\"\r"); // Replace x with mobile number  delay(100);  Serial.println("Accident Detected ");// The SMS text you want to send  Serial.println("please check location");// The SMS text you want to send  while(1)  {  gps\_read();  }  }  else  {  /\* Do nothing \*/  }  }  }  }  else  {  lcd.clear();  lcd.print("Alcohol ");  lcd.setCursor(3,2);  lcd.print("Detected");  delay(500);  digitalWrite(relay\_Pin, LOW);  delay(200);  digitalWrite(buzzer\_Pin, HIGH);  delay(200);  }  }  }  else  {  lcd.clear();  lcd.print("Seat Belt");  lcd.setCursor(3,2);  lcd.print("not Detected");  digitalWrite(relay\_Pin, LOW);  delay(200);  digitalWrite(buzzer\_Pin, HIGH);  delay(200);  }  }  void gps\_read()  {  byte a;    if(Serial.available())  {  a=Serial.read();    //Serial.write(a);    while(gps.encode(a)) // encode gps data  {  gps.get\_position(&lat,&lon); // get latitude and longitude    Serial.println("Position: ");  Serial.print("lat:");  Serial.println((lat\*0.000001),8);  Serial.print("log:");  Serial.println((lon\*0.000001),8);  }  }  }  **3.2 RESULT:**  Software Result:    Initially when the seatbelt is not detected(IR sensor value is given as 0), the message “Seatbelt not detected” is displayed on the LCD Display and the buzzer starts ringing and the vehicle doesn’t move.    In the next case, if the driver is wearing a seatbelt but is under the influence of alcohol(alcohol sensor is given as 1), then the message “Alcohol Detected” is displayed on the Lcd display and the vehicle doesn’t move.    In the ideal case where the driver is wearing a seatbelt and not under the influence of alcohol, the vehicle starts to move and buzzer stops ringing.    In case there is any accident detected(vibration sensor is given as 1), then the vehicle stops to move and a message saying that the driver has encountered an accident is sent to the family members or registered number in the gsm module along with the location of the accident.  **Hardware Model:**      **Components Required:**  1. Arduino UNO Board  2. 16\*2 LCD  3. MQ-135 Gas/Alcohol Sensor Module  4. LED  5. Breadboard  6. Connecting Jumper Wires  **HARDWARE CODE - Arduino Code:**  #include<LiquidCrystal.h>  LiquidCrystal lcd(7, 6, 5, 4, 3, 2);    int ledPin = 10;  int sensorPin = A0;  int value;    void setup()  {  Serial.begin(9600);  lcd.begin(16,2);  pinMode(ledPin,OUTPUT);  }  void loop()  {  int Value = analogRead(sensorPin);  value = analogRead(A0);  lcd.print("Alcohol Lev.:");  lcd.print(value-50);  Serial.print(value);  if (value-50 > 400)    {  digitalWrite(ledPin,HIGH);  lcd.setCursor(0, 2);  lcd.print("Alert....!!!");  Serial.print ("Alert");  }  else {  digitalWrite(ledPin,LOW);  lcd.setCursor(0, 2);  lcd.print(".....Normal.....");  Serial.print("Normal");  }    delay(500);  lcd.clear();  }  **Hardware Result:**  If the alcohol sensor senses alcohol level in the driver as greater than a certain limit(400), then the led starts glowing and an alert message is printed on the LCD along with the alcohol value.  If the alcohol sensor senses alcohol level in the driver as less than a certain limit(400), then the led doesn’t glow and a “....Normal.…” message is printed on the lcd along with the alcohol level.  **4 CONCLUSION**  This project will be very useful in saving people’s lives. Since seatbelt and driving without consumption of alcohol are necessary things to be followed while driving, this can be implemented as a solution. Also notification of any accident occurring will also be helpful for people.    **4.1 INFERENCE:**  We learnt the working of various sensors such as alcohol sensor, seatbelt sensor and accident detection sensor and how they can be used to protect the drivers.  We learnt how to use an arduino and how to program it to get a particular result.  We also learnt to connect different hardware components.  We learnt how an alcohol sensor works.  We also got to know how to apply different things in different fields for the use of people.  **4.2 FUTURE WORK:**  In future, this can also be added with a temperature sensor. Because in case there is any medical condition for any of the passengers such that the temperature of their surroundings should be in a particular range, people can adjust accordingly.  **4.3 COST:**  Arduino: 500  LCD Display: 200  LED: 10  Breadboard(small): 50  MQ 3 Alcohol Sensor: 200  Jumper Wires: 100  Total: 1060  **REFERENCES**   1. <https://www.researchgate.net/publication/324314274_Alcohol_Detection_of_Drunk_Drivers_with_Automatic_Car_Engine_Locking_System> 2. <https://www.ijert.org/automatic-engine-locking-system-through-alcohol-detection> 3. <https://www.irjet.net/archives/V6/i1/IRJET-V6I1294.pdf> 4. <https://www.researchgate.net/publication/327445845_Alcohol_Detecting_and_Notification_System_for_Controlling_Drink_Driving> 5. <https://www.researchgate.net/publication/324314274_Alcohol_Detection_of_Drunk_Drivers_with_Automatic_Car_Engine_Locking_System>   **PHOTOGRAPH OF THE PROJECT ALONG WITH THE TEAM MEMBERS :** |
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