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IoT Based Smart Car Monitoring System

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Abstract: *Due to the rapid increase in vehicles on the road, the probability of road accidents is rising steeply. Drunk driving is considered a major cause of road accidents worldwide. The main aim of this project is to develop a system that detects the amount of alcohol consumed by the driver. The proposed system aims to prevent the driver from operating the vehicle while intoxicated, thereby reducing the number of accidents caused by drunk driving. Additionally, it ensures that the driver wears a seatbelt. The system also includes an automatic headlight dim-dip control, which prevents the bright beam of light from disturbing oncoming vehicles. It features brake failure detection, which will identify brake failure and automatically slow down and stop the vehicle. The proposed model is developed using an Arduino Uno, with an alcohol detection sensor, brake failure sensor, and seatbelt sensor as its major components. As a safety measure, when the alcohol level exceeds a permissible limit, the vehicle's ignition system will be turned off, and the concerned authorities will be alerted via an IoT module.*

Keywords: IoT

I. INTRODUCTION

In recent epoch, there happens to occur lot of road accidents due to drunken driving and rash driving. Boulevard safety has become one of the major concerns in today's life. Drinking and driving is already a serious public vigor problem, which is likely to emerge as one of the most noteworthy problems in the near prospect. Not only does drunk driving contribute to tragic fatalities, but driving recklessly without wearing seatbelts also causes numerous preventable deaths. Seat belt is one among the key safety measure used in vehicles like cars to avoid major injuries to the driver driving the vehicle. Advanced life saving measures, such as electronic constancy control, also show momentous undertake for reducing injuries, e.g., crash analysis reports proves that more or less 34% of tragic traffic accidents could have been prevented with the use of electronic constancy control. Due to driver carelessness there occur to demand chief road accidents within the city, but outside the city, accidents mostly occur due to drunken driving. Presently, there transpire diverse technologies to reduce individual work and time intricacy.

According to road survey of Indian traffic police, every year in India nearly 3 lakhs major road accidents happens, which caused the death of 1,37,000 people. The main causes of these accidents are over-speeding, drunken drive, and loss of concentration of driver mainly found in truck drivers driving during night due to sleep deprivation. From total, 14,071 road accidents are due to drink and drive which causes death of 13 people every day. With the help of this proposed model, we have tried to achieve the objectives like, detection of alcohol consumption by the driver and matching it with the threshold value which we have calculated considering the study of BAC (Body alcohol content) and others factor. If the value exceeds the threshold value then the ignition should be in OFF state and vice versa in other state. To achieve the next objective i.e. controlling the ignition with the status of the seat belt of the driver, we have designed a switch based electrical circuit, depending on the status of the seat belt whether it is worn or not the switch will control the ignition system of the vehicle. For the safety purpose of the vehicle and the persons sitting inside it, when the ignition is on and the vehicle is in the moving state. This is used for detection of over speeding and rash driving of the vehicle and it can also be used for accident detection by determining the position of the vehicle i.e. whether the vehicle is in tilt position or normal position. We have used IoT communication protocol and server for the real time communication between the proposed system and the stakeholders.

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II. EXISTING SYSTEM

This study proposed an efficient technique for eradicating the upsurge in the number of cases of roads accidents caused by excessive intake of alcohol by drivers on the Nigerian roads. This study developed a prototype alcohol detection and engine locking system by using an Arduino Uno microcontroller interfaced with an alcohol sensor along with an LCD screen and a DC motor to demonstrate the concept. The system uses MQ-3 alcohol sensor to continuously monitor the blood alcohol content (BAC) to detect the existence of liquor in the exhalation of a driver. By placing the sensor on the steering wheel, our system has the capacity to continuously check alcohol level from the driver's breath. The ignition will fail to start if the sensor detects.

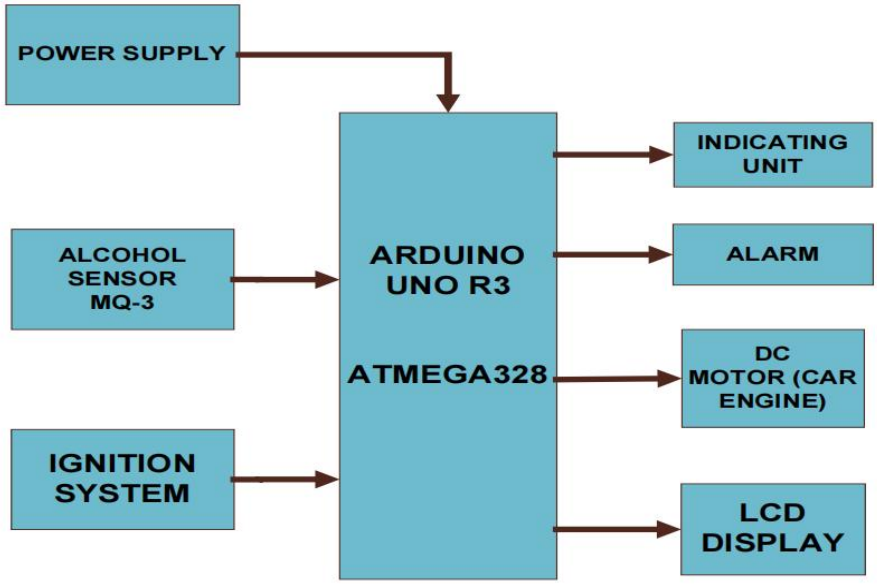

Figure 1 Block Diagram of Existing System

2.1 Existing System Drawbacks:

This system does not have Wi-Fi module

- In this system the vehicle starts even if the driver has consumed alcohol
- It cannot control if the car break system will be failure
- This system does not have a seat belt monitoring and controlling method.
- In this method driver should have consume the alcohol do not intimate the authority

III. PROPOSED SYSTEM

Here we propose a framework where the individual is identified for liquor 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 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. The other features are, if the seatbelt is not wear by the driver, the vehicle will not start. It also has the break failure sensor which will detect the failure of break and stop the vehicle.

Arduino uno is arranged and associated with the sensor additionally one dc motor is associated. Once the power supply is provided to the system, the engine will start running. This procedure is executed same in all vehicle where the car motor will be associated with the sensor. The MQ3 alcohol sensor operates on 5V DC and consumes approximately 800mW. It can detect alcohol concentrations ranging from 25 to 500 ppm. Once the alcohol sensor is detected, 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 miss chances by 75% and reduce the loss of property and lives.

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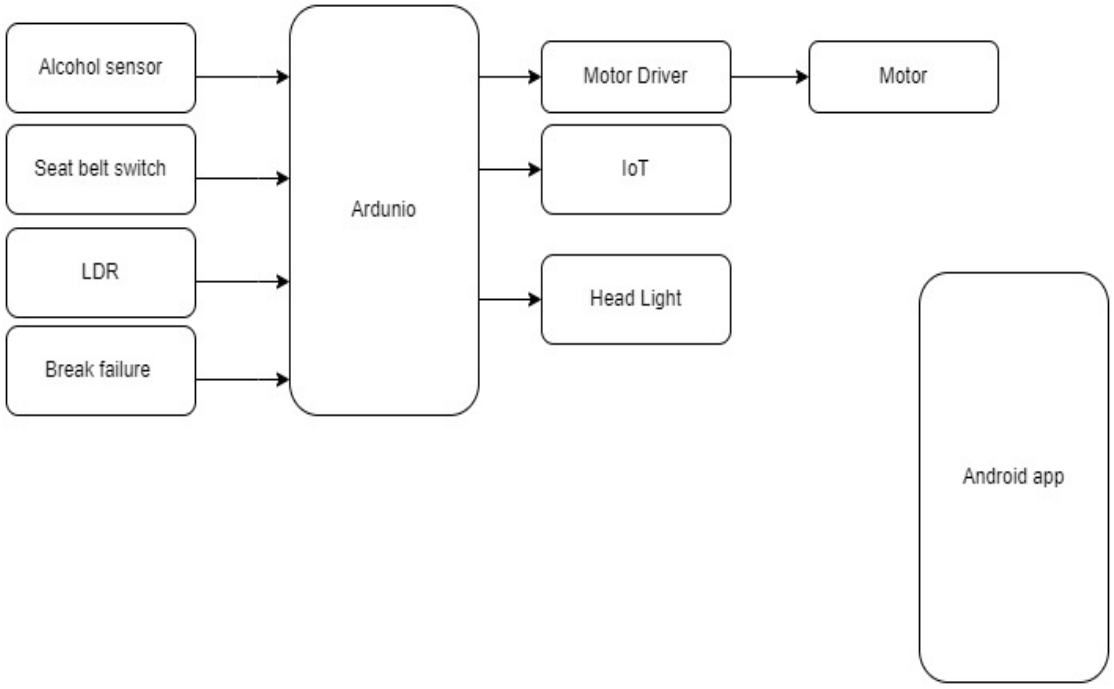

Figure 2 Block Diagram of Proposed System

IV. Results and Discussion

Our experiment setup includes,

- Hardware implementation of IoT based on smart car monitoring and reporting system.
- Code editor section
- Program for arduino uno
- Result and discussion
- Merits

4.1 Hardware Implementation of IoT based on Smart Car Monitoring System.

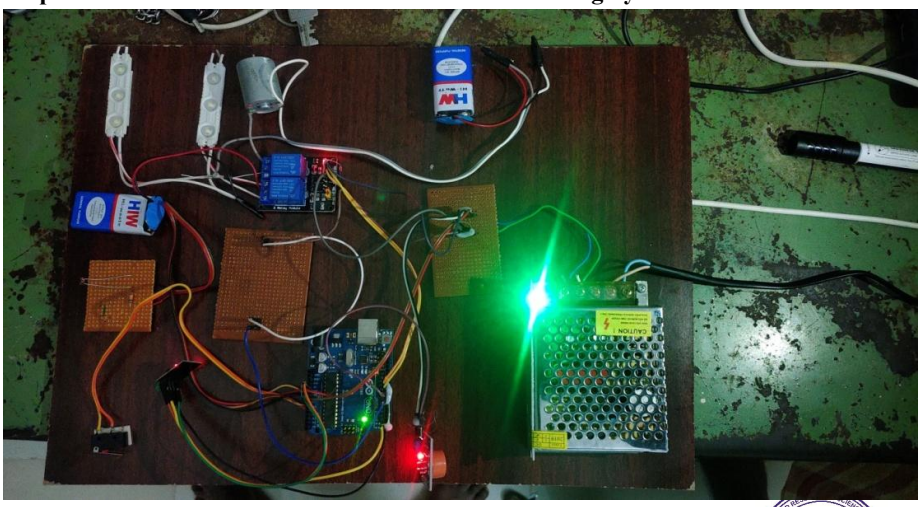

Figure 3 Hardware implementation

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4.1.2 Program for Arduino Uno

```
int motor = 10;
int hl = 11;
int gas = 8;
int seat = A1;
int brk=7;
int ldrval;
int cnt=0;
void setup() {
  pin Mode(motor, OUTPUT);
  pin Mode(hl, OUTPUT);
  pin Mode(gas, INPUT);
  pin Mode(seat, INPUT_PULLUP);
  pin Mode(brk, INPUT_PULLUP);
  Serial.begin(9600);
  digitalWrite(hl, HIGH);
  digitalWrite(motor, LOW);
}
void loop() {
  ldrval = analogRead(A0);
//  Serial.println(ldrval);
  if (ldrval < 100) {
    digitalWrite(hl, LOW);
  }
  else {
    digitalWrite(hl, HIGH);
  }
  if (!digitalRead(gas)) {
    digitalWrite(motor, HIGH);
  }
  else if (!digitalRead(seat)) {
    digitalWrite(motor, HIGH);
  }
  else if (digitalRead(brk)) {
 digitalWrite(motor, HIGH);
  }
  else {
    digitalWrite(motor, LOW);
 }
 cnt=cnt+1;
  if(cnt>15){
    cnt=0;
Serial.print("http://mangocity.appblocky.com/webdb/storeavalue.php?tag=dglvehicle&value=");
    Serial.print(digitalRead(gas));
    Serial.print(",");
    Serial.print(digitalRead(seat));
    Serial.print(",");
    Serial.println(digitalRead(brk));
    }
```

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```
  delay(500);
}
```

4.1.3 Result

We used MQ3 sensor to detection of alcohol consumption of the driver. If the driver consumed alcohol, it will detect and send signal to Arduino microcontroller to turn off the ignition of the vehicle. For dim and dip of headlight, we use LDR sensor to detect the intensity of the light, and it will send the signal to the microcontroller, so that it will control the headlight according to intensity of the light. If the light intensity is high, it detect as vehicle coming in front, so the microcontroller turn the dim light and vice versa.

We use mechanical switch to detect the whether the driver wear seat belt or not. It the driver wear it, it will consider it as normal. It the driver did not wear the seatbelt, it the microcontroller detects and turn off the ignition of the engine.

4.1.4 OUTPUT

Figure of 4 Output for normal

Figure of 5 Output for break failed

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Figure of 6 .Output for Seat belt

Figure of 7 Output for Alcohol

V. CONCLUSION

The proposed system checks for the drunken drive and avoids it effectively. We devised an effective strategy to combat the dangers of drunk driving in this project. Our major goal is to reduce the number of people killed or injured as a result of drunk driving. Nowadays, with emerging technologies, the automobile industry uses various sensors and controllers to provide an equipped environment. Taking advantage of this phenomenon, we have developed a mechanism for providing secured driving near the seat belt buckle. The driver is not permitted to drunken driving and also without the seatbelt. Also we implement the automatic dim dip control of the headlight to avoid accident due to high beam of the headlight. We use Light sensor for the detection of light intensity and it will automatically change the headlight status.

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