WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Alcohol and Speed Detection for Highway System

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ABSTRACT -

Accident due to drowsy is prevented and controlled when the vehicle is out of control. And also the drunken drive also prevented by installing alcohol detector in the vehicle. The term used here for the recognisation that the driver is drowsy is by using eye blink of the driver. In recent times drowsiness is one of the major causes for highway accidents. These types of accidents occurred due to drowsy and driver cant able to control the vehicle, when he/she wakes. The drowsiness is identified by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame. The alcohol consumption is also verified during the starting process of the vehicle using alcohol detector. If the driver is drunk then the buzzer indicates and the vehicle doesn't allow the driver to start the vehicle. If the driver is drowsy, then the system will give buzzer signal and the speed of the vehicle is reduced and the obstacle sensor will senses the adjacent vehicle to avoid collision with that, and if there is no vehicle in left adjacent side then the vehicle move to the left end of the road by auto steering and controlling and vehicle will be parked with prior indications.

KEYWORDS :-

- Alcohol Detection System
- Speed Monitoring
- Drunk Driving Prevention
- Highway Safety

INTRODUCTION :

Providing safety to a person while riding the Car is of prime concern. One of the way to do this is by making it mandatory to wear Eye Blink while riding a Car. This is difficult to implement as every time the concerned people can't keep an eye on everybody. So detecting whether the driver has worn a Eye Blink or not, as well whether he has consumed alcohol or not is the main problem. The system what we have planned to design provides solution to this problem. The system makes it mandatory for the rider to wear Eye Blink before starting the vehicle and also he shouldn't have consumed alcohol. If the rider fail to do so then the vehicle cannot be started. This system also provides security to the vehicle as every Car will have an unique Eye Blink and without which a person fails to start that particular Car. This project includes a Eye Blink body and an integrated electronic system disposed in the Eye Blink body. It is operated through a wireless control system. The components of the electronic system are sufficiently small and rugged for use in the Eye Blink, ensuring that the Eye Blink is lightweight and durable. Moreover, the components are spaced about the Eye Blink to provide even weight distribution to promote overall balance and safety

BLOCK DIAGRAM :

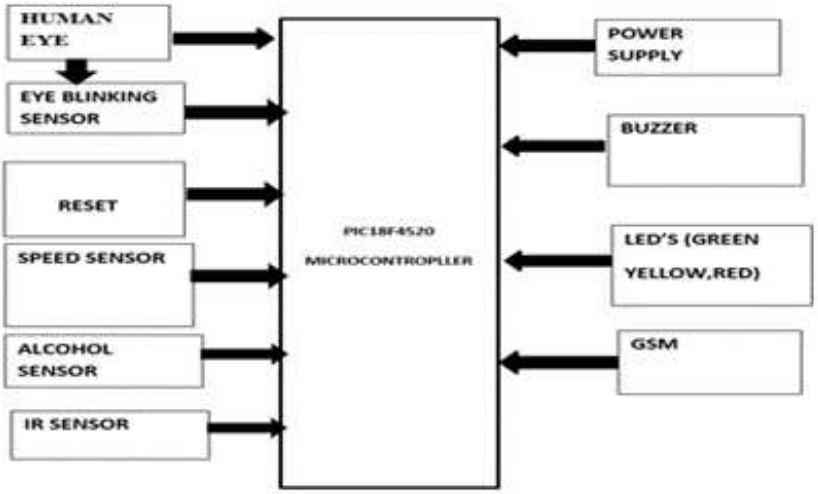

Figure 1. Block Diagram

WORKING :

- **1. Alcohol Detection Module:**

The system uses an MQ-3 alcohol sensor placed near the driver's seat (or steering).

When the driver breathes near the sensor (intentionally or naturally), it detects the alcohol concentration in the breath.

If the detected value exceeds the pre-set threshold (e.g., 0.04% BAC), the microcontroller triggers:

A buzzer or red LED as a warning.

Optionally, it can disable the ignition system to prevent the car from starting.

An SMS alert is sent to authorities via a GSM module.

- **2. Speed Detection Module:**

Speed is measured using:

IR sensors (distance/time-based) for small prototypes.

Or GPS modules for real vehicle applications to track real-time speed.

If the speed crosses a set limit (e.g., 80 km/h):

A warning buzzer is activated.

A message is displayed on the LCD (e.g., "Overspeeding! Slow Down").

The event is logged and optionally sent via GSM to the control room.

- **3. Microcontroller Unit (MCU):**

A microcontroller like Arduino Uno or Raspberry Pi processes sensor data.

It compares the inputs from alcohol and speed sensors with pre-defined safe values.

It controls outputs like buzzers, displays, SMS modules, or vehicle systems.

- **4. Alert and Communication:**

A GSM module (like SIM800L) is used to send real-time alerts to police/highway patrol.

Example message: *"Alert! Alcohol detected in vehicle No. MH12AB1234"* or *"Overspeeding detected on Highway 48"*.

- **5. Data Logging:**

Data such as alcohol level, vehicle speed, and time are logged using:

SD card module or

Cloud platforms like ThingSpeak or Blynk (if IoT is integrated).

LITERATURE SURVEY :

- **Kumar et al. (2021**) developed a fuel-cell- based alcohol detection system integrated into vehicles, highlighting its real-time functionality and accuracy. The system has been shown to improve road safety by preventing impaired driving
- **Schneider (2020)** examined electrochemical and semiconductor sensors, emphasizing the advancements in sensor technology that can now be miniaturized and embedded in car interiors for continuous monitoring.
- **Williams et al., 2020**. Adaptive Cruise Control: Modern vehicles use radar and camera systems to adjust vehicle speed automatically, enhancing safety

METHODOLOGY :

The methodology for alcohol speed detection involves the integration of alcohol sensors and vehicle speed monitoring systems to assess the correlation between a driver's alcohol consumption and their driving behavior. A gas sensor, such as the MQ-3 or similar, is installed near the driver's seat to detect the presence and concentration of alcohol in the breath. Simultaneously, a GPS module or a speed sensor is connected to the system to monitor the vehicle's speed in real-time. The microcontroller processes data from both sensors to evaluate whether the driver is under the influence and whether their driving speed exceeds safe limits. If alcohol is detected beyond a pre-set threshold, the system triggers an alert or immobilizes the vehicle engine to prevent driving under the influence. Data collected is logged for further analysis, providing insights into how alcohol affects driving speed and overall safety. This setup ensures continuous monitoring and can be integrated with safety enforcement systems for real-time intervention..

ACTUAL SYSTEM

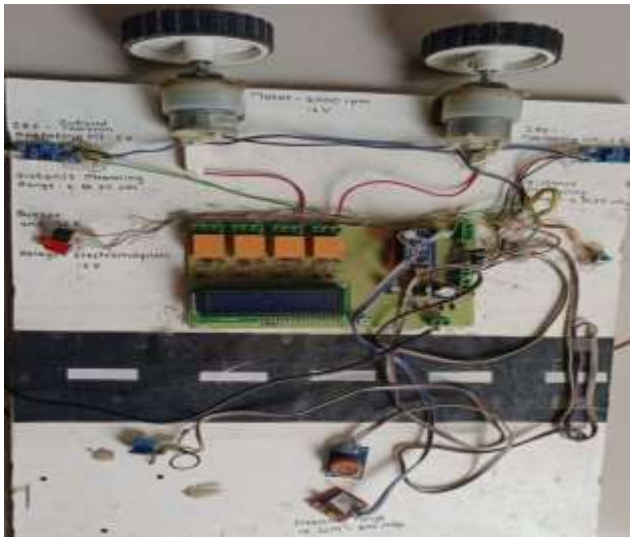

Figure 2: Actual System

FLOWCHART :

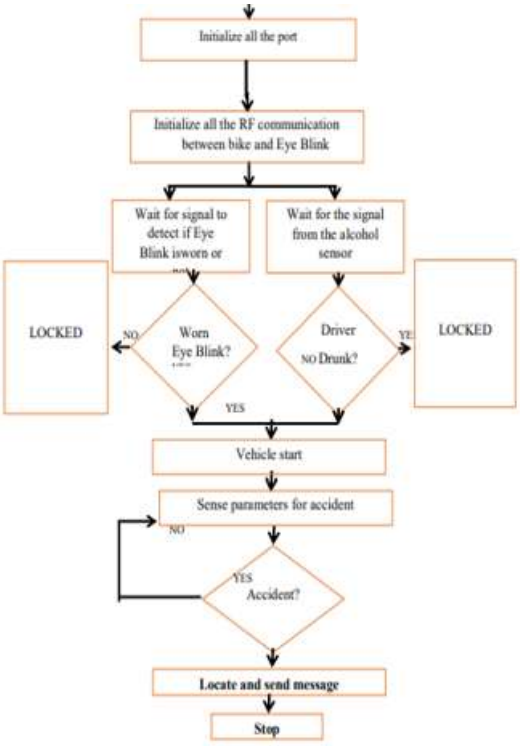

Figure 3: Flow chart

CONCLUSION :

This system was designed majorly to avoid motor Car accident. The accidents are increased majorly due to absence of Eye Blink or the usage of alcoholic drinks so the major objective of this system is to develop an electronic smart Eye Blink system. This system sequentially checking the Eye Blink wearing and drunken driving. By implementing this system we can reduce head injuries occur offend. It helps the driver to control vehicle easily. And it is most economical and easy to use. So it has good social aspects authority. Prevention with advanced Eye Blink is better than unfortunate incident. In case of unfortunate fall, shall inform the concerned.

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