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AUTO-ALCO SAFETY DETECTOR

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ABSTRACT: The "Auto-Alcho Safety Detector" is a project that aims to enhance road safety by integrating various sensors and technologies to prevent drunk driving, accidents, and fire accidents. The system utilizes an Arduino microcontroller, a 16x2 LCD display, vibration sensor, fire sensor, alcohol sensor, GSM modem, and power supply. Upon attempting to start the vehicle by pressing the start button, the system scans the alcohol level of the driver using the alcohol sensor. The vehicle is only allowed to start if the alcohol level is low, otherwise, the vehicle is prevented from starting. Additionally, if the system detects a high alcohol level, it triggers an automatic vehicle shutdown. In case of an accident, the vibration sensor captures the incident, and the system reports it to the ambulance services along with the location coordinates through a URL that points to Google Maps. Similarly, in the event of a fire accident, the fire sensor identifies the situation, and an SMS is sent to the fire service station along with the location of the incident through the GSM modem.

I. INTRODUCTION

Drunk driving and accidents caused by various factors are major concerns in road safety. Despite strict laws and regulations, incidents of drunk driving and accidents continue to occur, resulting in injuries, fatalities, and property damage. Traditional approaches to prevent drunk driving and accidents have limitations and may not always be effective. Therefore, there is a need for an advanced system that integrates technology to enhance road safety and prevent accidents.

II. EXISTING SYSTEM

The existing systems for preventing drunk driving and accidents often rely on human intervention, such as breathalyzer tests or manual reporting of accidents. These methods have limitations, as they can be easily bypassed or delayed, leading to accidents and injuries. Moreover, traditional approaches may not have the capability to automatically detect fire accidents and report them promptly to the relevant authorities.

III. PROPOSED SYSTEM

The proposed "Auto-Alcho Safety Detector" project offers a comprehensive solution to prevent drunk driving, accidents, and fire accidents using advanced technologies. The system utilizes multiple sensors, including an alcohol sensor, vibration sensor, and fire sensor, along with an Arduino microcontroller and GSM modem for communication. The 16x2 LCD display provides real-time information about the system's status.

When the driver attempts to start the vehicle by pressing the start button, the alcohol sensor scans the alcohol level. The vehicle is allowed to start only if the alcohol level is low, ensuring that the driver is not under the influence of alcohol. If the alcohol level is high, the system triggers an automatic vehicle shutdown to prevent drunk driving.

In case of an accident, the vibration sensor captures the incident, and the system sends a report to the ambulance services along with the location coordinates through a URL pointing to Google Maps. This allows for quick response and medical assistance, potentially saving lives.

Furthermore, the system is capable of detecting fire accidents using the fire sensor. Once a fire is detected, an SMS is sent to the fire service station along with the location of the incident through the GSM modem, enabling prompt action to extinguish the fire and minimize damage.

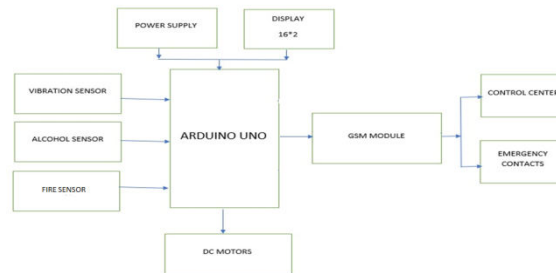


Figure 1: Data Flow Diagram

The block diagram for the "Auto-Alcho Safety Detector" project can be summarized as follows:

Input Devices:

Start Button: When the driver presses the start button to initiate the vehicle, it serves as an input trigger for the system to start scanning for alcohol levels.

Alcohol Sensor: Measures the alcohol level of the driver and provides the input to the system for further processing.

Vibration Sensor: Detects any sudden changes in acceleration or deceleration, indicating an accident or collision.

Control Unit:

Arduino: Acts as the main control unit that receives inputs from the start button, alcohol sensor, and vibration sensor. It processes the inputs and controls the operation of the system accordingly.

Output Devices:

16x2 LCD Display: Displays real-time information about the system's status, such as the alcohol level and system alerts.

GSM Modem: Sends SMS notifications to the fire service station in case of a fire accident, and to the ambulance service in case of an accident, along with the location coordinates.

Safety Sensors:

Fire Sensor: Detects the presence of fire and sends an alert to the system in case of a fire accident.

Alcohol Sensor: Measures the alcohol level of the driver to determine if it's safe to start the vehicle.

Power Supply:

Provides the necessary power to operate the system and its components.

Operation:

When the driver presses the start button, the Arduino triggers the alcohol sensor to measure the alcohol level of the driver. If the alcohol level is low, the vehicle is allowed to start, and the system displays the alcohol level on the LCD display. If the alcohol level is high, the Arduino sends a signal to stop the vehicle from starting, preventing drunk driving. Meanwhile, the vibration sensor continuously monitors for any sudden changes in acceleration or deceleration that may indicate an accident. If an accident is detected, the vibration sensor sends an alert to the Arduino, which then sends a report to the ambulance service along with the location coordinates through a URL pointing to Google Maps. Additionally, the fire sensor constantly monitors for the presence of fire. If a fire is detected, the fire sensor sends an alert to the Arduino, which then sends an SMS notification to the fire service station along with the location of the incident through the GSM modem. Overall, the "Auto-Alcho Safety Detector" project integrates multiple sensors, an Arduino microcontroller, LCD display, and GSM modem to create a system that enhances road safety by preventing drunk driving, detecting accidents, and reporting incidents promptly to the relevant authorities for timely action.

HARDWARE IMPLEMENTATION RESULTS

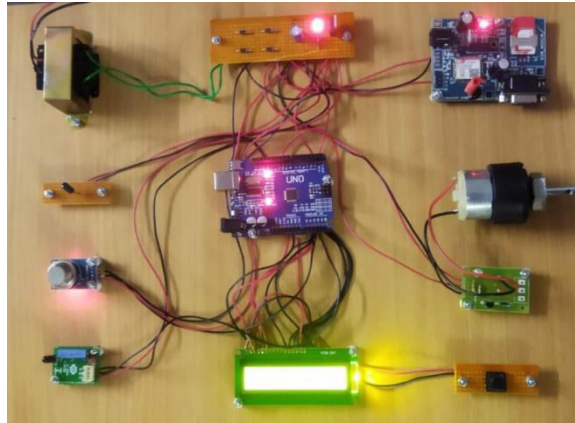


Figure 2: Hardware Implementation

The above figure represents the over all hardware implementation of our project. “Auto-Alcho Safety Detector” .



Figure 3: SMS sending to Ambulance

The above figure represents the SMS sending to ambulance when the vehicle is met with the accident



Figure 4: SMS Sending to Fire Station

The above figure represents the SMS sending to fire station when the vehicle is met with an fire accident.



IV. CONCLUSION

The "Auto-Alcho Safety Detector" project is a promising solution to enhance road safety by integrating advanced technologies to prevent drunk driving, accidents, and fire accidents. The system offers a reliable and automated approach to detect alcohol levels, capture accidents, and report incidents to the relevant authorities promptly. This project has the potential to significantly reduce the risks associated with drunk driving, accidents, and fire accidents, making roads safer for everyone.

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