

Intelligent System for Detecting Driver Drowsiness Alcohol and Heart Attacks using IOT Technology

Harshavardhini Budupula¹, Yamuna Bezawada², Nagaswetha Chennu³, Teja Boyina⁴, Dr. Ch. Ram Babu⁵

¹Final Year B.Tech Students, ²Associate Professor - Department of Electronics and Communication Engineering
Seshadri Rao Gudlavalleru Engineering College, Gudlavalleru, Andhra Pradesh, India

Abstract: Ensuring the effectiveness of medications relies heavily on their secure storage and accurate tracking, particularly within hospitals, pharmacies, and supply chains. This initiative introduces a monitoring system for medicine storage built on IoT principles, utilizing Arduino,

GSM, and GPS to deliver continuous environmental oversight, location data, and automatic notifications. Temperature and humidity sensors are used to perpetually check storage environments, guaranteeing that drugs stay within their required climatic ranges. An Arduino board analyzes the sensor readings and interfaces with a GSM component to dispatch immediate text message warnings to responsible staff should conditions stray beyond safe levels. A GPS unit also supplies live location information, allowing for vigilant oversight during transit to mitigate misplacement or pilferage. Information can be recorded and sent to a cloudbased service for distant monitoring, empowering medical staff and supply chain supervisors to base their choices on current data. This approach improves drug security, minimizes spoilage from incorrect storage, and helps adhere to regulatory standards for pharmaceutical preservation. Merging IoT functionality with GSM and GPS connectivity, the suggested system presents an economical, compact, and dependable method for supervising medicine storage, applicable to both fixed installations and moving logistics.

I. INTRODUCTION

Numerous accidents involving avenues are caused by weariness, exhaustion, and other factors. Approximately half of all accidents occur on the streets. Avenue accidents could be caused by inadequate usage, which should rise if the driver is drunk or drowsy. It has been demonstrated that driver fatigue and intoxication are major contributors to traffic accidents. Additionally, this has made it very challenging to create a machine that would prevent this issue. IOT-based innovation is typically far more practical to deal with because it runs on a real-time device and can transmit any data or information without human interaction. Because of its nature, weariness is a protection issue that no

US in the world has yet to effectively handle. Drowsiness is presently very difficult to detect or investigate, in contrast to alcohol and drugs, which have obvious key signs and assessments that can be obtained with ease. An IOT-based device is designed to avoid many accidents caused by sleepy drivers' behavioral and mental changes by concentrating on driving force's eye moments and health difficulties like coronary heart attack, vertigo, and various fitness issues. After focusing on the drowsiness aspect of it, we will evaluate other health markers like pulse and alcohol detection. Benefiting from sleepy riding is a relatively new strategy that can be put into practice. However, this study investigates how IOT-based innovation would use IOT sensors and methodologies to provide propelled dimensions of services and, in essence, change how individuals live their daily lives. Because of its nature, weariness is a safety concern that no nation in the world has sufficiently addressed. Drowsiness can be exceedingly challenging to quantify or identify, in contrast to alcohol and drugs, which have widely available tests and unambiguous key signs. An IOTbased device aims to prevent numerous accidents caused by sleepy drivers' behavioral and mental changes by focusing on motive force's eye moments and health difficulties including heart attacks, dizziness, and other fitness issues. This assignment's main objective is to develop a system that can effectively predict the motive force's health characteristics and drowsiness, utilizing sensors to notify the motive force and lower the increasing number of injuries. Over the course of the assignment, we will address the following problems:

- 1) Identifying Sleepiness in Drivers
- 2) Alcohol Detection
- 3) Pulse Rate Monitoring System
- 4) IOT and GSM

The primary purpose of this device is to track the driving force's face expressions and eye movements. The apparatus will issue a warning if the motive force seems drowsy. When

drowsiness is identified, the driver is alerted with a buzzer. A variety of motive force characteristics, such as pulse rate, alcoholic condition, and eye blink, are measured by heartbeat, alcohol, and eye blink sensors. There are many items that show the potential degree of driver fatigue in different types of vehicles. The same characteristics are provided by the driving force sleepiness detection and health tracking device, but with better results and further advantages. It also alerts the client when the level of drowsiness reaches a specific saturation factor.

II LITERATURE SURVEY

1) This research presents an IoT-based driving force drowsiness and fitness parameter detection system. This gadget has a buzzer to warn the driver when he is sleepy and a USB digicam for the EyeBlink Monitoring System. Additionally, they have covered the location of a GPS to song motive force. In this situation, the administrator will monitor system characteristics and notify friends and family in the event of an emergency. Wearable temperature and heartbeat sensors are used to track the health of drivers. Alcohol sensors are used to identify alcoholic conditions of motive force. When the level of alcohol exceeds a threshold, the car's speed decreases and it stops (speed limiters are available). The goal of this project is to create an affordable gadget that can be used in a variety of cars and save lives. A USB digicam is used to detect drowsiness, and a built-in Python library is used to process the data. A buzzer is used to sound an alert if the driver is sleepy. Additionally, the device continuously monitors health data, such as heart rate and driving force frame temperature. By using GPS to locate him, friends of a doctor or driving force can reach him in an emergency. Consequently, the twist of fate ratio can be reduced.

2) The evaluation of eye state evaluationbased techniques and suggested device and distraction detection strategies has been completed in this study. When compared to other methods, they found that Eye Nation evaluation is superior (nonintrusive, low computing cost, strong, accurate). Wearable smart glasses are the primary tool used by the proposed system to identify sleepiness. Sleep detection theory: 0–2 to 0–4 seconds to blink (usually) A person is deemed to be asleep if their eyelids are closed for longer than thirty seconds. The proposed small bandpass CR light sensor is intended for wearable smart glasses that are lightweight, inexpensive, and may have a higher signal-to-noise ratio (SNR) than industrial ones. DFD Recognition logs the student, nose, and eyeball shapes. It detects whether the eyes are closed or open. If closed and drowsiness is noted, DFD uses BLE to transmit a warning message to the IVI telematics platform.

3) To identify driving force tiredness and the point at which a driver is sleepy, they have employed AI-based, far improved algorithms. In 2015, there were 4,64,674 injuries in India. The primary cause of these injuries is either the driver is sleepy or does not adhere to the guest laws. When compared to the United States, India offers a better avenue twist of fate price. Lane detection, heart rate, and guide wheel motion pattern detection are some of the features that have been used thus far to identify drivers' fatigue. A person is considered drowsy if they close their eyes for five seconds, but we require more time to assess a person's level of sleepiness, and the price at which they are drowsy is also no longer taken into account. They used the Python open CV library to convert the video into frames. To identify the frames in which the individual is sleepy, they have employed the Eye element Ratio (EAR). It is computed by summing the two distances from the eye's top stop to its bottom quit, which are then divided by the horizontal distance. of the focus. Neural network classifiers and decision tree classifiers have been employed. Although the neural community classifier has produced results that are almost identical, they claimed that the DT classifier is superior to all other classifiers for that mission. Therefore, we will classify the difficulty as either drowsy or non-drowsy using any of the two classifiers.

4) An IOT-based sleepiness detection and emergency notification gadget is a safety innovation that helps prevent accidents caused by sleepy drivers. According to a number of studies, the motive force's tiredness is responsible for about 20% of all traffic accidents. The first part uses an alcohol sensor to measure the amount of alcohol in the driver's breath. If the alcohol content is higher than the edge cost, the driver is considered to be intoxicated, a buzzer may sound, a "alcohol detected" message will appear on the liquid crystal display, and the car will not start. The next component requires the motive force to wear sunglasses with an eye-blink sensor at some point during his journey in order to detect sleepiness. A buzzer may sound, a "drowsiness detected" message may appear on the liquid crystal display, and the motor pace may be lowered if the driver does not blink his eyes for a few seconds. In the last part, the notification system is used after the alert device. If the driver is found to be intoxicated and sleepy, a message and the location data may be sent to the Telegram software, allowing the user to use this information to save the driver who is in danger. A number of causes are involved in car accidents, such as drunk driving, speeding, and various distractions like texting while driving, conversing with others, gambling with children, and so on. Sleeping at the wheel is one of the crucial components. Many drivers are unable to control their cars due to various factors, which can lead to serious injuries and

even death. It is crucial to disclose the driver's tiredness in order to prevent injuries since a fatigued driver who nods off while driving is unable to maintain control of the vehicle.

5) A sleepiness detection system based on Google Glass is proposed in this paper. In order to monitor the frequency of eye blinks, a proximity sensor is attached to the glass. operating a vehicle. Twenty three seasoned drivers—ten adult males and thirteen girls—were tested for this. It occurred between 8 a.m. and 8 p.m. found that the proximity sensor's threshold algorithm can consistently detect eye blinks, demonstrating the viability of utilizing Google Glass to detect operator tiredness and potentially placing sleepy drivers at greater risk than distracted drivers.

III PROPOSED MODEL AND DESIGN

A. System Design

Two microcontrollers make up our suggested system: The ignition key, ignition relay, buzzer, eyeblink sensor, pulse sensor, temperature, and alcohol sensor are all connected to the Arduino Nano and ESP32. The ESP8266 board is linked to the GPS, GSM, and water sprinkler. The cloud server receives all of the data from these sensors. We are employing two microcontrollers because the Arduino lacks internet access, which is why the ESP8266 is being used.

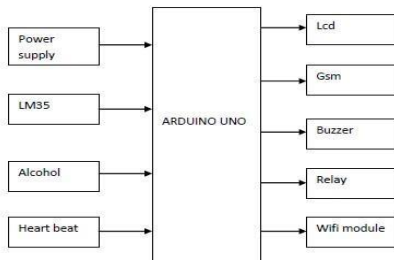


Fig. 1. Block diagram of the proposed System.

Fig. 1 describes the block diagram of As we have seen the major connections in the block diagram, next is to insert the SIM card into the GSM.

IV. SOFTWARE AND HARDWARE

ARDUINO UNO:



Fig. 2. Arduino UNO Board

Fig. 2 describes the ATmega328P-based Arduino UNO microcontroller board, which features six analog inputs, a 16 MHz ceramic resonator, a USB connector, a power jack, an ICSP header, a reset button, and fourteen digital input/output pins. A regular USB cable can be used to easily connect the board to a computer. This microcontroller board is reasonably priced and readily available [13].

ESP8266:



Fig. 3.ESP8266 WiFi Module

Fig. 3 describes the ESP8266, a low-cost WiFi module from the ESP series that can be used worldwide for remotely controlling electronic tasks. It is capable of connecting to WiFi networks due to its integrated microprocessor and 1 MB of flash memory. The module communicates using WiFi signals through its built-in TCP/IP protocol stack. It operates at a maximum voltage of 3.3V, and applying 5V may damage the module.

Relay:

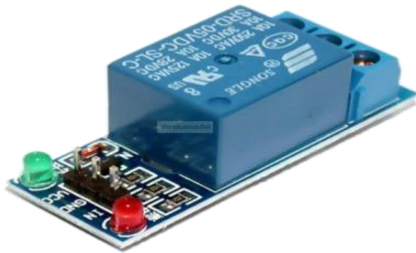


Fig. 4. Relay Module

Fig. 4 describes the relay module, an electrically operated switch controlled by an electromagnet. A low-power signal from a microcontroller activates the electromagnet, which in turn opens or closes an electrical circuit. The relay consists of a coil (electromagnet), an iron core, a movable armature, and contact terminals. When energized, the electromagnet attracts the armature, changing the state of the contacts. When de-energized, a spring returns the armature to its original position, either opening or closing the circuit depending on the relay configuration.

Pulse Sensor:



Fig. 5. Pulse Sensor

Fig. 5 describes the pulse sensor, where when the heart pumps blood, the volume of blood vessels changes, creating a pulse wave that the pulse sensor monitors. The user simply touches the sensor with their finger to determine the pulse wave status, which is then shown on the dashboard.

LCD:

LCD stands for Liquid Dynamic Display. Large unfold usage substitution is being discovered by LCD. the ability to display images, numbers, and letters. LEDs, on the other hand, can be limited by quantity plus a few numbers. By integrating the sterile management within the LCD, the CPU is relieved of the task of sterilizing the LCD.

BUZZER:



Fig. 6. Piezoelectric Buzzer

Fig. 6 describes the buzzer. Beepers and buzzers are examples of audio signaling computing devices that might be electromechanical, piezoelectric, or mechanical. Converting the sign from audio to sound is the most essential feature of this. It is typically powered by DC voltage and utilized in computers, printers, timers, alarms, and other devices. It is made up of two extremely accurate, negative pins. The '+' symbol or a longer terminal is used to symbolize this fantastic terminal. This terminal is connected to the GND terminal and is powered by the helpful resource of 6 volts, whereas the horrible terminal is denoted by the '-' symbol or fast terminal.

EYE BLINK SENSOR:



Fig. 7. Eye Blink Sensor

Fig. 7 describes the Eye Blink uses infrared to detect eye blinks. Its values change with each blink of the eye. The output is high if the eye is closed, and vice versa. The buzzer is then triggered by the values it receives, and after three times, the water spray is activated.

ALCOHOL SENSOR:



Fig. 8. Alcohol Sensor

Fig. 8 describes a Metal Oxide Semiconductor (MOS) sensor, which is what the MQ3 is. It is highly sensitive to alcohol and resilient to smoke and gasoline. The sensor's conductivity increases as the concentration of alcohol gas rises, signifying the presence of the gas through the flashing of its LED.

GSM:



Fig. 9. GSM Module

Fig. 9 describes the hardware element that enables electronic devices to interact via the GSM network is called a GSM module (Global System for Mobile Communications). Sending and receiving SMS messages, making voice conversations, and accessing mobile data services are all made possible by its role as a bridge between a microcontroller (or other computer devices) and the mobile network.

DC MOTOR:



Fig. 10. DC Motor

Fig. 10 describes any rotating electrical device that transforms direct current electrical energy into mechanical energy is referred to as a DC motor. The most prevalent kinds depend on the forces generated by magnetic fields. Almost every kind of DC motor has an internal electromechanical or electronic device that occasionally reverses the direction of current flow in a portion of the motor. Since DC motors could be driven by the directcurrent lighting power distribution systems that were already in place, they were the first type of motor to be widely employed.

ARDUINO IDE:

Arduino is an open-source association for programming and PC tools. The activity and consumer mastermind who builds and works with microcontroller-based motion sheets is advised to visit the Arduino Community. These alternative sheets are identified as open supply prototype stages known as Arduino Modules. The microcontroller board that has been smoothed out shows up in a variety of growth board bundles. Using the Arduino IDE, which incorporates the C programming language, is the transcendently felt programming approach. This gives you access to an Arduino library that is diligently creating a perception of an open supply network.

V. EXPERIMENTAL RESULTS

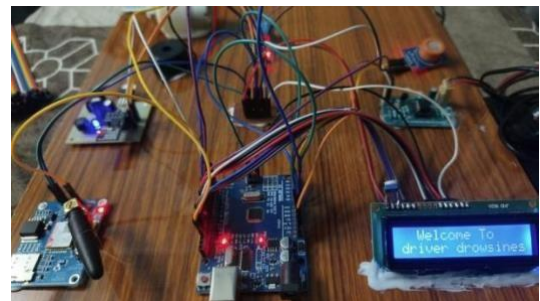


Fig. 11. Performance Analysis

To identify the health parameter and drowsiness, our suggested method requires the driver to wear goggles and a pulse sensor. All of the parts come on when the ignition key is turned on, and a pulse sensor measures the driver's heartbeat, which is then shown in the cloud. The eye blink sensor on the goggles will detect and sound a buzzer if the driver's eyes are closed for longer than four seconds.

Similarly, if the driver's eyes are closed three times, the ignition key will automatically turn off and water will be sprayed on their face. Our suggested system's MQ3 sensor identifies the driver's level of intoxication, which is then recorded in the cloud and communicated to the family member along with the driver's position. Our suggested system's ultrasonic sensor identifies things whenever a driver is sleepy, intoxicated, or ill due to a health parameter and notifies the driver via a buzzer, thereby reducing accidents.



Fig. 12. Results and Discussions

- 1) Hotspot: In order to operate our suggested solution, the hotspot must first be turned on.
- 2) Adaptor: In order to turn on every component, the adaptor must next be switched on.
- 3) Pulse sensor: In order to assess his heartbeat and address one of the health parameters, the driver is required to wear a pulse sensor.
- 4) Goggles: In order to identify tiredness, the driver must wear goggles.
- 5) Buzzer: The buzzer activates if it detects both drowsiness and an obstruction.
- 6) Water sprinkler: If the driver's drowsiness is detected three times, water is sprayed on their face.
- 7) Ignition key: When the water sprinkler is turned on and alcohol is detected, the ignition key goes off.
- 8) Cloud: It shows the pulse value; if the driver has not consumed alcohol, it is shown as green; if they have, it is shown as red. Next, the ignition key value appears as ON/OFF. The map shows the driver's location and indicates whether or not they are sleepy.

VI CONCLUSION

Around 21% of traffic accidents worldwide are caused by sleepy driving, and this percentage is continually rising. In contrast, drunk driving is responsible for about 28% of accidents, and this number is rising quickly. The analysis of all the available research papers revealed that while each study used a different method for identifying driver drowsiness, they all used comparable strategies to lessen or prevent it. The eye state analysis-based techniques are the

superior methodology for detecting drowsiness/fatigue, according to our comparisons of various drowsy detection techniques. Eye-state analysis-based techniques have numerous advantages, including minimal computation costs, high accuracy, high robustness, and non-intrusiveness. Certain data, such as temperature, heart rate, and alcohol consumption, are measured in some research articles, and the car stops or slows down in response. Our objective is to put in place a system that guarantees driver safety and prevents auto accidents based on these findings.

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