



# A REVIEW ON DROWSY DRIVING DETECTION DEVICE USING ARDUINO AND EYE-BLINK SENSOR

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**Abstract:** Driver inattention is one of the biggest contributors of road accidents. Driver fatigue and distraction are the two leading reasons of crashes involving vehicles. Tired drivers are just as dangerous as drunk drivers since they have shorter reaction times and less attention, awareness, and control of their automobiles. Driving while disoriented or distracted can result in a horrific death and can also endanger or jeopardize the safety of others. A fraction of a second of poor visual judgement can result in permanent blindness. Effective actions should be implemented to prevent driver drowsiness to lessen the frequency of road accidents. This paper has a significant impact on those who do not care for themselves. This is a safety mechanism that informs the driver if he becomes drowsy. The driver's eye movement is tracked, and if the driver falls asleep or closes their eyes for more than 2 seconds, a buzzer or vibrator will detect and notify the driver. Using an Arduino micro-controller as a foundation, this operation provides a low-cost option in automotive safety technology for accident avoidance and, as a result, reduces road traffic accidents. This paper aids in the prevention of such accidents and serves as a preventive measure to lower the danger of national accidents, particularly those caused by drowsy driving.

**Keywords -** Drowsiness, brutality, buzzer, Arduino, micro-controller

## I. INTRODUCTION

With the time changes and the lifestyle of the people, everyone needs to be quick and in hurry whether it is for work or in any other thing. In this fast moving world people need quick response of anything they want to do. They want to take shortcuts in everything they do, and this leads to

trouble to them and others also. Accidents on the road are one of the leading causes of errors made by humans when driving. People do multitasking like eating, checking up their phones, not using proper safety equipment's and also driving in drowsy state that leads to harm to their health and also to others. Based to study in the United States of America 16, 189 individuals have been died while 3, 27, 000 people suffer severe injuries because of drunken driving [1]. To avoid these modern smart automobiles from being stolen, firms such as Nissan have included alcohol detectors in the vehicle's modules. Aside from that, numerous projects and studies are underway to minimize accidents while driving. As far as people know the importance of their life they also need to know that as much as driving in alcohol or in drunk condition is dangerous, the same goes to driving in a condition of fatigue or in sleepiness. Drowsy driving is one of the reason that people ignore and leads to brutal accidents. An exhausted driver is a person who falls sleepy during driving and loses the ability to handle their car, which leads to an incident. It is always vital to keep track of the driver's state of attentiveness to stay out of mishaps. [2].The motorist's lack of attention during driving is frequently identified as the primary root cause of devastating crashes on roads. And the frequency of mishaps can be significantly minimized by preventing drowsiness and notifying motorists.[3].With rapidly change in technology it is possible to prevent from such accidents and there are many experiments done previously that are being successful and has a positive response. Sleepiness identification by cardiovascular rate fluctuation and respiratory fluctuation was carried out with an elevated degree of correctness by employing a method called Logistic Regression Assessment. Several computational image processing, as well as feature extraction algorithms, as well as extraction of features algorithms, have been employed to figure out the motorist's

eye blink rates. This method has attained 94% accuracy when it is conducted on experimental level.[4].To avert fatalities triggered by restlessness, lots of studies is carried out which concentrate upon two aspects: the inside

protection of drivers and the external safety of their vehicles. Experts studying the inner unit of automobiles are primarily interested in motorists.

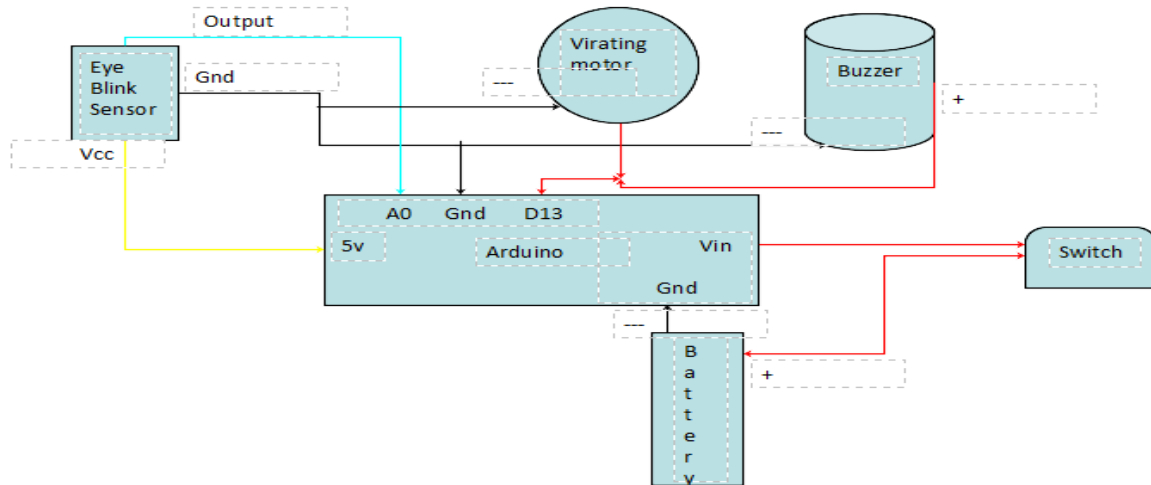


Fig.1 Schematic diagram of detection system

This is why fatigue among motorists and diminished motorist concentration are the main root causes of 20% of wrecks and 30% of mortality across the globe.[5].There are many studies that suggests that for detecting the drowsiness of a driver the eye blink of a person is need to be consider first. The person in drowsy state has very high time of eye blink as compared to a normal people. Many methods have been proposed to automatically notice some eye blinks based on video series. At the time of making of such devices that uses sensors and a mechanism that is suitable of preventing such situation the cost of devices is also consider in mind as it can easily be use Or bought up by any normal people.[6].Nearly all of the present-day technologies feature a camera that's positioned right in front of the motorist. It evaluates the motorist's face and eyes. Since to determine whether the person is napping. But with it affecting forward, it hinders the motorist's frontal perspective. As a consequence, it might lead to additional difficulties while driving a vehicle.[7].The review deals with eliminating fatal crashes triggered by drowsy driving as well as lack of focus of motorists because of their lack of focus via offering an ongoing eye flicker recognition device which emphasizes the motorist every time their eye fails to blink by the device's established value to guarantee motorist's and others' well-being. as well.[8].

## II. LITERATURE REVIEW

Memon et al .[9] described that road accidents are a growing public health concern, with over 1,37,000 deaths in India in 2013 and one death every four minutes due to a road accident.Drowsy driving accidents are capable of being

circumvented by employing a sensor for an eye blink system. This system uses object tracking and machine learning to detect eye blinks even if the driver's head is moving and has an efficiency of 80%. The system is cost-effective and can detect driver's eyes from various positions, and there are future plans to integrate it with an alcohol detection module and head motion tracker for better results. Gowri et al. [10] described an eye blink sensor system can prevent accidents caused by driver drowsiness. The driver wears the sensor frame when motoring, the motorist puts on a monitoring frame, and whenever they blink over a few seconds, it identifies sleepiness. Any variations in steering action lowers wheels pace, and if the person driving goes asleep while the LCDs exhibit alert messages, the linked vibrating device vibrates. By the scenario, the vehicle slows or stops, and the proprietor is told via the GSM module of the motorist's location, image, and the nearby law enforcement agencies. This proposed system helps avoid vehicle accidents due to driver fatigue detection.He et al.[11] created a system to detect employing eye blinking monitoring to identify distractions in drivers. Cumulative eye blinks every minute and eye-closing closing duration are used to determine the driver's tiredness, and a comparison is made with a standard value to determine whether the driver of the vehicle is not attentive. A total of 120 different samples had been gathered across multiple lighting locations and times of day to test the system, and it achieved an accuracy of 92.7%. The system is cost-efficient, portable, and could be integrated into an android app in the future. The enhanced system would recognise and inform motorists who use smartphones while motoring, which is one of the significant variables leading to driver's loss of



consciousness. Mukherjee et al.[12] described drowsy driving has been a prominent cause of accidents, and most existing detection technologies rely on complex image processing algorithms that are ineffective at night or are not generally available. Eye-awake is a low-cost drowsy driver alert and vehicle correction system that detects the physiological parameters of the driver to detect drowsy driving. On the road, the system achieves 70% accuracy and costs under \$40 to create. To keep costs low, the design employs simple yet accurate sensors, and the system gives external notifications to nearby cars and pedestrians. Future improvements could include multi-threaded micro-controllers, image processing, and artificial intelligence to forecast driving manoeuvre, while cost control will be crucial to keeping the product affordable to all consumers. Kolpe et al. [13] described about large number of vehicle accidents caused by micro sleep is a serious source of concern. A vehicle sleepiness detection system is required to safeguard the safety of drivers and other cars on the road. To reduce accidents, this proposal proposes a real-time car drowsiness detection system with an ignition lock. To identify driver tiredness, the device employs an eye blink sensor implanted in wearable glasses and a heartbeat sensor. When high levels of drowsiness are detected, the device informs the driver with a buzzer and locks the ignition. When a harmful amount of drowsiness is detected, the vehicle will be slowed and eventually halted. The device also features an SMS notification system that sends the location to relatives or friends. Upender et al. [14] described the dangers of driving while drowsy are well-known, with lives at risk if drivers fall asleep at the wheel. This study aimed to develop a device that could help prevent accidents caused by drowsiness or sleepiness, specifically by detecting when a driver is feeling drowsy and triggering an alert system. An electronic device was designed and programmed using an Arduino Uno and an eye blink sensor, with an accuracy rate of 80% achieved in tests. However, it is recommended that future research explores other sensors to detect blinking rates as the IR sensor used is sensitive and not durable for long-term use. Additionally, a wireless connection for transmitting the sensor's output is recommended, and machine learning and neural networks may be utilized in further research. Mahajan et al .[15] described in his article highlights the issue of drowsiness while driving and its role in causing major road accidents. To address this issue, the article suggests the use of an eye blink sensor and CNY70 sensor that are linked to an Arduino UNO. The eye blink sensor detects the blink rate, and if the eyes are closed for more than 5 seconds, the car's speed is reduced. The CNY70 sensor detects signs of weariness, and the alarm system is activated to alert the driver. The technology is designed to prevent drivers from falling asleep while driving, and the buzzer sounds to inform the driver if sleepiness is detected. The article also suggests using this technology to determine if coma patients

have recovered and to include additional external elements for tiredness measures. Overall, the technology is intended to protect drivers from drowsiness-related accidents and may be used in a variety of automobiles. Jang et al .[16] described that drowsiness is a significant cause of road accidents and the solution to this issue is data science. A detection system has been developed that can prevent accidents caused by drivers falling asleep at the wheel. Studies show that 21% of all fatal accidents are due to drowsy driving and around 167 million drivers worldwide have experienced drowsiness or fatigue while driving in the past year. This poses a major problem not only for drivers but also for pedestrians and other drivers on the road. The system monitors the driver's eye movements live and alerts them through a buzzer, vibrator or water sprinkler if they feel drowsy or close their eyes for more than 2 seconds. A combination of different detection methods can be used for effective and reliable drowsy driver detection. The system overcomes limitations of previous systems and uses deep learning models to detect faces and eyes, with a CNN model predicting the driver's status. There is a wide scope for improvement in the future, and the system may become a part of a road safety system used in every vehicle, potentially saving many lives.

### III. CONCLUSION

Eye blink IR sensor system is a safety device designed to detect drowsiness in drivers and prevent accidents caused by fatigue. This system works by using an infrared sensor to detect the number of times a driver blinks their eyes while driving. When the driver's blink rate falls below a certain threshold, the system triggers an alarm or warning to alert the driver to take a break. Eye blink system and drowsiness as a cause of accidents is become a reason for many researches and many are also done previously about the same. The use of eye blink sensor systems in preventing road accidents has become an area of active research in recent years. These systems can detect drowsiness in real-time, which means that the driver can be alerted immediately to take corrective actions. Compared to other drowsiness detection systems, such as EEG-based systems, IR sensor-based systems are more affordable and cost-effective. These systems have been shown to have high accuracy rates in detecting drowsy driving, which makes them a reliable method for preventing accidents. From the above review study it has been evident that to avoid or reduce the accidents caused by drowsiness while driving has to be consider as a safety advisory and such safety system has to be used in taking considerations of the road safety of self and others. it can be concluded that an eye blink monitoring system can be an effective solution for detecting drowsy driving. The paper also discussed the benefits of using such a system, It possesses an opportunity of reducing the overall number of mishaps brought on by



drowsy driving. Additionally, the review paper noted that such a system could be easily attached or used into existing vehicle safety systems. However it is fact that everything has its positive and negative points. It also noted Additional studies are required in order to fully comprehend the success rate of these systems and to develop more accurate and reliable methods for detecting drowsiness. Overall, the review paper suggests that eye blink system stated above have great potential as a device for reducing the risk of drowsy driving, but more research is needed to fully use or get their benefits.

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