

Drowsiness Detection System Using Goggles

Sakshi Pawar¹, Nikita Jadhav²

¹ Student, Department of Computer Engineering, Marathwada Mitra Mandal's Polytechnic, Pune, Maharashtra, India

² Student, Department of Computer Engineering, Marathwada Mitra Mandal's Polytechnic, Pune, Maharashtra, India

ABSTRACT

India is a developing nation. The number of vehicles in the country has increased over the last decade as the population has grown. Though road networks have improved, the increased vehicle population has exacerbated safety concerns. It is a well-known fact that "national health is more important than national wealth." As a result, road safety is a major public health concern, and attention must be paid to road safety measures. Drowsiness while driving causes major traffic accidents. Drowsiness caused by fatigue driving is becoming more common these days. This project is primarily concerned with road accidents that occur when people are sleepy and lethargic / half asleep or otherwise drowsy while driving. The project employs an infrared sensor to determine whether a person is drowsy or not based on whether their eyes are closed or open.[1] When the eyes are closed for more than 5 seconds, it detects sleep and alerts the user via a buzzer alarm. As in "The driver is sleepy." Accidents can occur as a result of inactivity, which is controlled and prevented by the alarm.

The goal of this purpose design is to detect drowsy drivers in order to prevent accidents and improve highway safety. On the Arduino nano, a method for detecting driver drowsiness/sleepiness is developed. All of this is done on Google. The goal was to make drivers safer and reduce the number of fatalities caused by drowsy driving.[3]

Keywords: Goggles, Drowsiness, innovative, Fatal.

1. INTRODUCTION

Every year, approximately 1.3 million people are killed in car accidents, which are the leading cause of death. The majority of these accidents are caused by distractions or driver drowsiness. The construction of high-speed highway roads had reduced the driver's margin of error. Every day and night, a large number of people travel long distances on the highway. A lack of sleep or distractions such as a phone call, talking with a passenger, and so on may result in an accident. In recent years, one of the leading causes of vehicle accidents worldwide has been driver fatigue. According to the National Highway Traffic Safety Administration (NHTSA), approximately 100,000 people are killed in car accidents caused by drowsy drivers. Drivers' attention levels deteriorate as a result of insufficient sleep, long periods of continuous driving, or any other medical condition such as brain disorders, among others.[2] When a driver drives for longer than is normal for a human, excessive fatigue occurs, as does tiredness, which causes the driver to fall asleep or lose consciousness. Drowsiness is a complex phenomenon in which the driver's alertness and consciousness levels decrease. Although there is no direct measure to detect drowsiness, several indirect methods can be used. To avoid such collisions, we propose a system that alerts the driver. So, we created an innovative Goggles that detects a person's sleep and alerts him with a buzzer alarm. The goal of this project is to create a prototype of a drowsiness detection system. As a result, detecting the driver's drowsiness is critical in order to save lives and avoid accidents on today's roads.[1]

- Need for the system

Driver drowsiness detection is a safety Goggles technology that aids in the prevention of accidents caused by drowsy driving. [2]According to various studies, fatigue is responsible for approximately 20% of all road accidents, and up to 50% on certain roads. As a result, a new system is required.

- Detailed Problem Definition

Drowsy driving is a major issue. Nobody knows when sleep takes over their body. This impairs the driver's ability to concentrate on the road. It has an impact on the driver's ability to make sound decisions. According to the National Highway Traffic Safety Administration, drowsy driving is responsible for nearly 1,00,000 traffic accidents, including more than 1,500 deaths and more than 70, 000 injuries. Fatigue is another major contributor to car accidents.[3]

- Future Prospects

We extend this project by using the Goggles to detect the driver's drowsiness. The driver drowsiness detection system detects the driver's drowsiness. If the driver becomes drowsy, the sensor detects our eyes and the buzzer sounds until our eyes open. [1] This proposed system uses Arduino to detect drowsiness. This helps to prevent many accidents.

1.1 Objective

The project's goal is to detect drowsiness while driving and alert the driver at the appropriate time to avoid any mishaps. The project employs an infrared sensor to determine whether a person is drowsy or not based on whether the eyes are closed or open. The project's main goal was to make drivers safer and reduce the number of fatalities caused by drowsy driving.[3]

1.2 Scope Of Project

- Capture individual drivers' drowsy steering activity.
- Additional simulator experiments should be carried out to validate the algorithm, test additional road conditions, and test a more diverse group of drivers.
- Based on-road test data, test and refine the algorithm, and conduct research on warning systems integrated with the detection system.
- It is used to prevent road accidents.

1.3 Principle components of project

1. Arduino nano
2. IR Sensor
3. 3V battery
4. Switch
5. Transparent glass
6. Buzzer

2. ASSEMBLY OF PROJECT

This paper aims to detect drowsiness while driving and alert the driver at the appropriate time to avoid any mishaps. In this case, we've used an alarm to keep things from going wrong.[4] We used an infrared sensor and separate LEDs that were extended with insulated copper wire because the sensor should be in front of the eyes and the module on the handle of the glasses. We drilled holes in the glasses for the photodiode and IR sensor fittings using soldering wire. And we've added the code to Arduino. On the other side, a 3.8 V battery is installed, and an IR sensor module, an Arduino nano, a switch, and a buzzer are connected and adhered to it. A glue gun is also used for sticking. And the innovative road safety project is now operational. When the eyes are closed for more than 5 seconds, it detects sleep and alerts the person via alarm using a buzzer until the person is woken up. [1] Accidents can occur as a result of drowsiness, which is controlled and prevented by the buzzer.

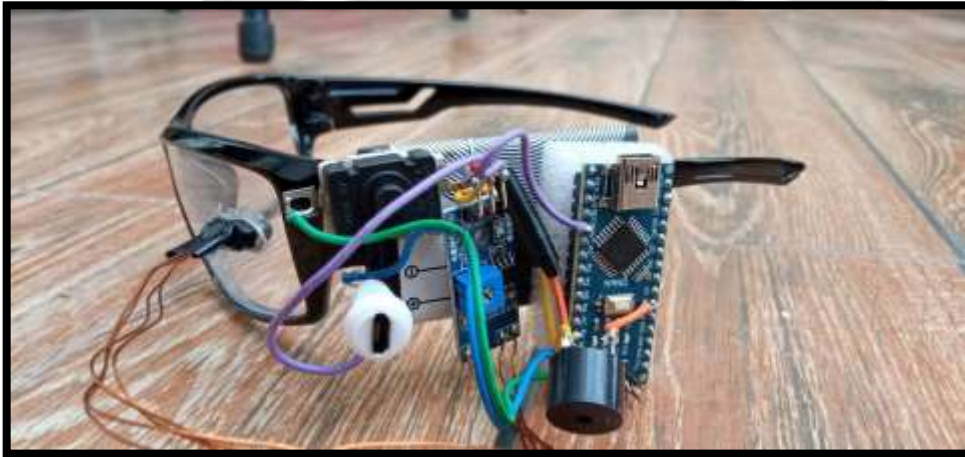


Fig 1: Assembly Project

3. WORKING

In this project, we have used I-R sensor with LED's, Arduino Nano , Buzzer, Battery of 3.8 V all this components which is connected with each other and the LEDs are extended in front of glasses.

I-R Sensor's first pin (out) which is connected to Arduino nano's A0; Second pin(GND) ground which is connected to the GND of Arduino and the third pin which is Vcc of IR sensor is connected to 5V of Arduino Nano.[2]

Arduino Nano's first pin (Vin) Voltage input which is connected to the positive(+ve) of the Battery and GND is connected to the negative(-ve) of the battery.

Buzzer's positive pin is connected to Arduino's D13 pin and the negative pin is connected to the GND of Arduino nano and the battery

The innovative Goggles which detects the sleep of a person and alerts him by the alarm by using a buzzer. If the person is feeling drowsy while driving a car or bike and the person can't control himself and he/ she slept more than 5 sec then the IR detects the eyes and pass the connection to the buzzer alerting the person at buzz till the person wakes up and after he wakes up he/she have to stop the buzzer by clicking on the button on Arduino Nano.

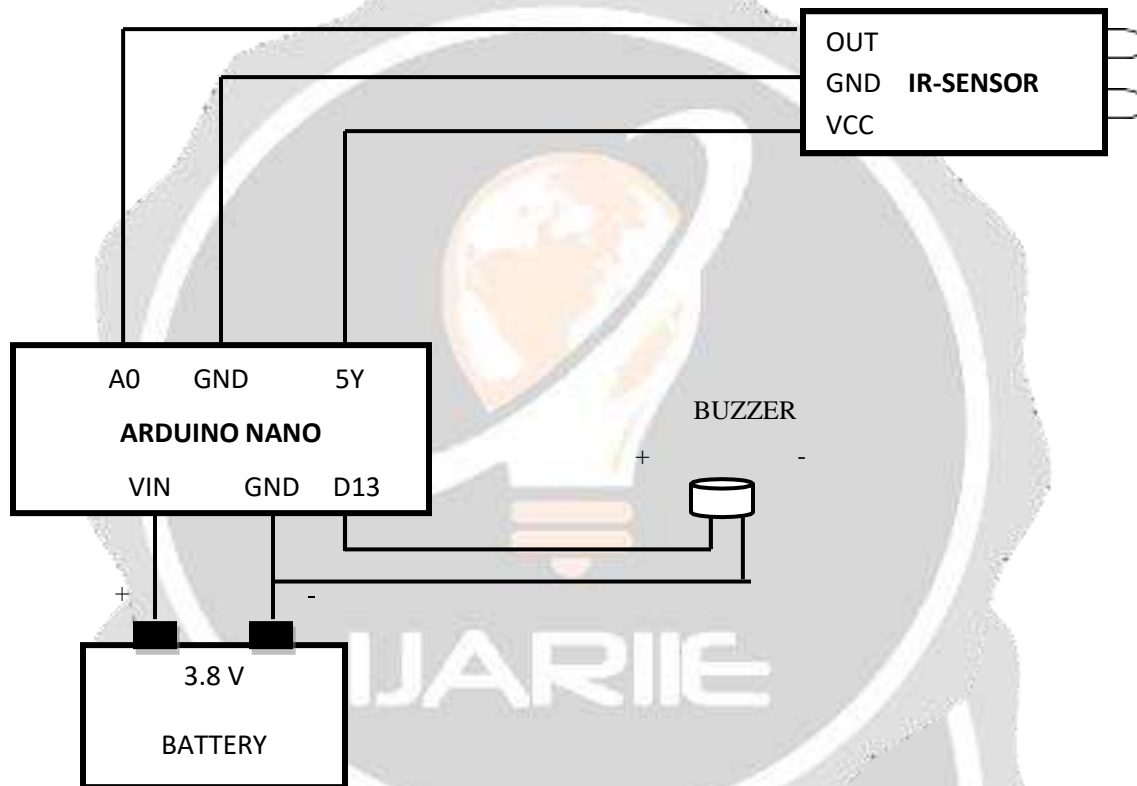


Figure 2: Circuit Diagram

4. CONCLUSIONS

Drowsiness detection is used to detect drowsiness quickly. This system prevents the driver from falling asleep while driving. The buzzer alerts the driver if the eyes are closed for a period of time that can be set in the code.[2] This paper is intended to protect drivers from drowsiness-related accidents. It is applicable to all types of vehicles. This system can be used in both cars and motorcycles. It may concentrate on the use of other external factors such as sleeping hours, vehicle state, weather conditions, and mechanical data for fatigue measurements.[1]

5. ACKNOWLEDGEMENT

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6. REFERENCES

- [1] https://www.researchgate.net/publication/319464008_Driver_Drowsiness_Detection_Systems
- [2] <https://www.sciencepubco.com/index.php/ijet/article/download/16167/6813#:~:text=The%20speed%20of%20rotation%20is,stopped%20when%20the%20accident%20occurs.&text=The%20purpose%20>

of%20this%20sensor,accident%20occurrence%20in%20real%20time.

[3] IoT-Based Smart Alert System for Drowsy Driver Detection (hindawi.com)

[4] https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.researchgate.net/publication/349964463_IoT-Based_Smart_Alert_System_for_Drowsy_Driver_Detection&ved=2ahUKEwjOo9uckv_3AhU3SmwGHc71DGYQFnoECAsQAQ&usg=AOvVaw0tZdd7_Fk7v_eU6oD4Lnos

