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Anti Sleep Alarm System

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Abstract: ***In modern-times, owing to hectic schedules it becomes very difficult to remain active all the time. Imagine a situation where a person is driving home from work, dead tired after facing all the challenges of the day. The hands are on the wheel and foot on the pedal but suddenly started feeling drowsy, the eyes start shutting and the vision blurs and before it knew, then the person fall asleep.***

Falling asleep on the wheel can lead to serious consequences, there may be accidents and people may even lose their lives. This situation is much more common and hence, it is very important to counter this problem. So to address this issue, the Project Anti Sleep Alarm for Drivers is introduced. This system alerts the Person falls asleep at the wheel thereby, avoiding accidents and saving lives.

This system is useful especially for people who travel long distances and people who are driving late at night. The circuit is built using Arduino Nano, a switch, a Piezo buzzer, Micro Vibration Motor and an Eye blink sensor. Whenever the driver feels sleepy and asleep the eye blink sensor detects and the buzzer turn ON with a sound of an intermediate beep. When driver comes back to his normal State eye blink sensor senses that and buzzer turns OFF.

I. INTRODUCTION

The drowsiness detection system is capable of detecting drowsiness in quickly. The system which can differentiate normal eye blink and drowsiness can prevent the driver from entering the state of sleepiness while driving. The system works well irrespective of driver wearing spectacles and under low light conditions also.

During the monitoring, the system is able to decide if the eyes are closed or opened. When the eyes have been closed for too long a warning signal is issued.

The ultimate goal of the system is to check the drowsiness condition of the driver. Based on the eye movements of the driver, the drowsiness is detected and according eye blink, the alarm will be generated to alert the driver and to reduce the speed of the vehicle along with the indication of parking light. By doing this, many accidents will be reduced and provides safety to the driver and vehicle.

A system that is driver safety and car security is presented only in luxurious costly cars. Using eye detection, driver security and safety can be implemented in normal car also.

II. LITERATURE REVIEW

At first, Dreißig, et al. [2] designed and tested a feature selection technique founded on the kNearest Neighbor algorithm for the driver's state classification.

Their result of the research showed that the impact of sleepiness on the driver's blink behavior and head motions is shown in a final analysis of the highest performing feature sets.

Another work Baronti, et al. [4] described a minimal, basic distributed force sensor that is ideal for sensing handgrip strength and hand location on a wheel.

They suggested that the sensor can be utilized in active safety systems in automobiles to detect driver drowsiness.Chieh, et al. [3] offered a technique for detecting drowsiness in automobiles by measuring the driver's grip force on the steering wheel and comparing it to the fluctuation in grip force caused by weariness or loss of attentiveness. Vural, et al. [5] described a video-based method for detecting driver sleepiness.

Throughout sleepiness periods, they used machine learning to analyze authentic human behavior. Kurt, et al. [6] created a new approach for automatically estimating vigilance level Utilizing electroencephalogram (EEG), electromyogram (EMG), and eye movement (EOG) data captured during the changeover from awake to sleep. They established this approach for concentration requiring tasks like lorry driver. Khushaba, et al.

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III. METHODOLOGY

Block Representation

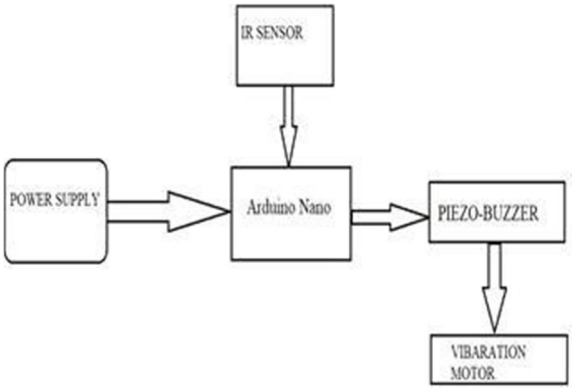


Figure: Block Diagram

IV. HARDWARE COMPONENTS

A. Arduino Nano

A Nano Arduino is a compact version of an Arduino microcontroller board, designed for small-scale projects with limited space.

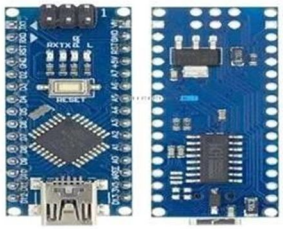


Figure: Arduino Nano

B. Piezo Buzzer

A buzzer is an electronic device that produces sound, typically a simple tone, when an electrical signal is applied to it.



Figure: Piezo Buzzer

C. Micro Vibration Motor

A micro vibration motor is a small device that generates vibrations typically used in mobile phones, wearable devices, and other electronics for feedback or alert notifications.



Figure: Micro Vibration Motor

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D. LED Indicator

Response Indicators are connected to the Detectors in order to indicate quickly the source of an alarm signal from Detectors which are not easily accessible or visible. The Response Indicators contain an indicator lamp unit with one resp. two LED. They light up as soon as the connected fire detector gives an alarm.



Figure: LED Indicator

E. Battery

A battery is a device that stores chemical energy and converts it into electrical energy, typically consisting of one or more electrochemical cells.



Figure: A 9V Battery

F. SPST Switch

A Single Pole Single Throw (SPST) switch is a basic type of electrical switch that has only one input terminal and one output terminal, allowing for the circuit to be either open or closed.



Figure: SPST Switch

G. Eye Glasses

The eye blink system comes with an IR sensor mounted on glasses which the user can wear like regular glasses, shown in the picture below. Eye blink Sensor is a relatively simple sensor used to detect eye blinks. It uses a simple infrared sensor to detect if the person's eye is closed and the corresponding data received can further be processed by any logic as required for the application.



Figure : Eye glasses with Sensor

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H. IR Sensor

An infrared (IR) sensor is a device that detects infrared radiation emitted by objects, allowing it to sense motion, proximity, or temperature changes without direct contact.



Figure: IR Sensor

V. RESULT

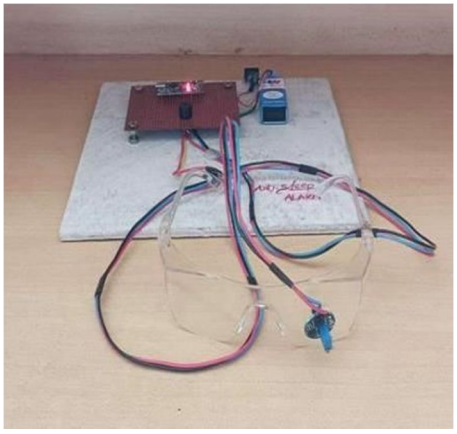


Figure: output result

Circuit Diagram

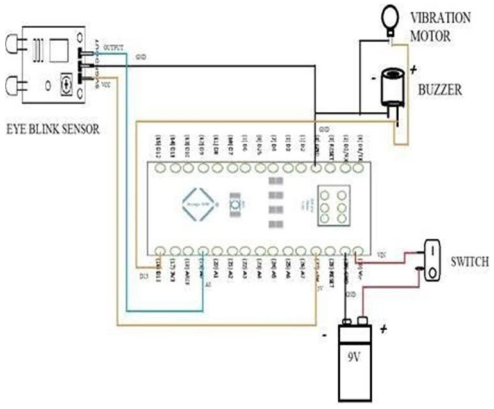


Figure: Circuit Diagram

VI. CONCLUSION

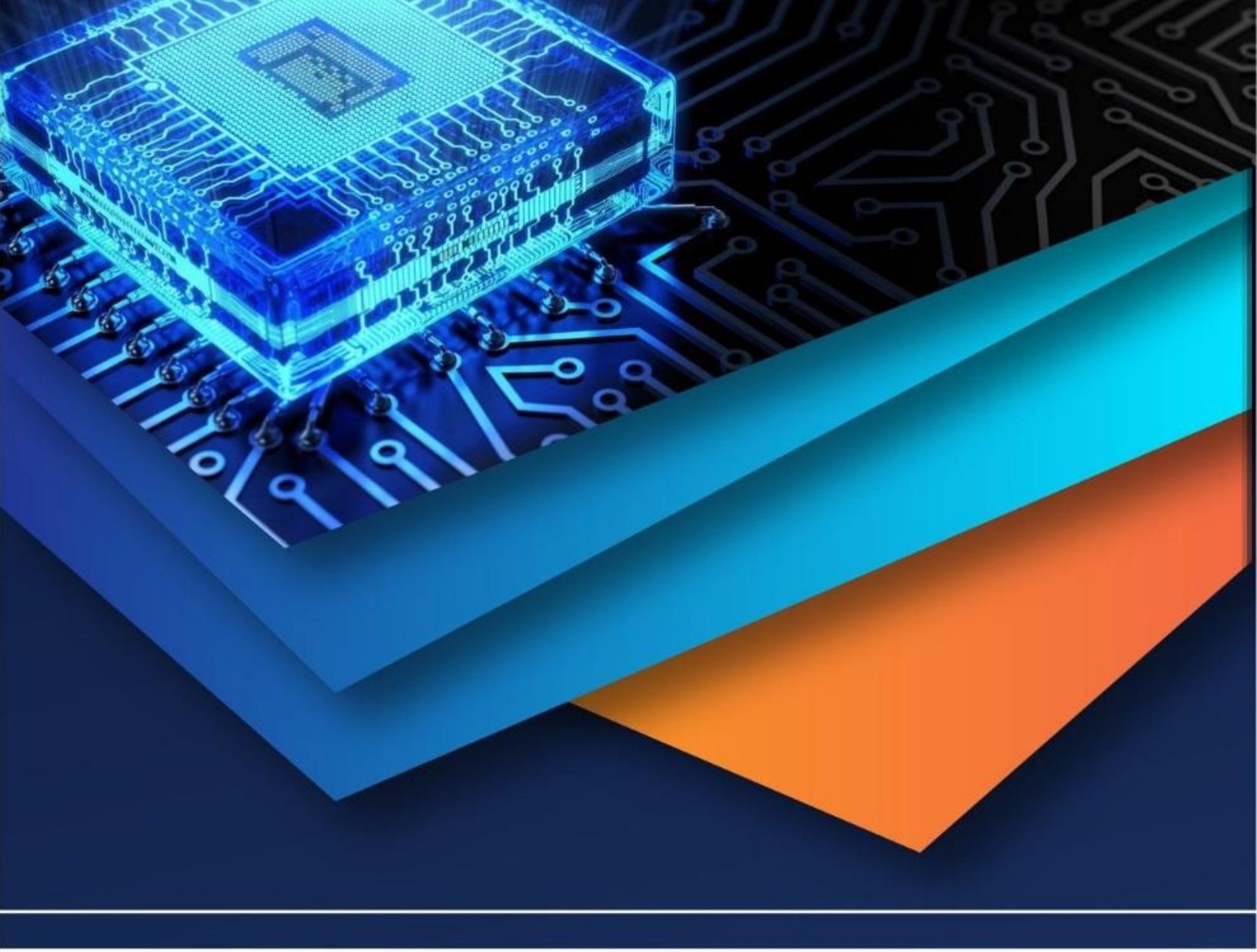
This Project “ANTI-SLEEP ALARM FOR DRIVERS” is successfully designed, and tested and demo unit is fabricated. The goal of this project is to develop a device that can accurately detect sleepy driving and make alarms accordingly, which aims to prevent the drivers from drowsy driving and create a safer driving environment. The project was accomplished by an IR sensor. This system detects the drowsiness in quickly. This system which can differentiate normal eye blink and drowsiness can prevent the driver from entering the state of sleepiness while driving. Whenever a driver asleep due to drowsiness, the buzzer continuously starts beeping unless the driver gets back to his/her normal position. The ultimate goal of the system is to prevent the road accident, where the values measured in life.

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