DRIVER SLEEP ALERT SYSTEM

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ABSTRACT
The number of deadly car accidents caused by drivers falling asleep at the wheel has risen dramatically in recent years.When the motorist nods off, he loses consciousness and causes an accident.The driver loses control of his car due of the high pace at which he is traveling. Most car accidents may be traced back to drivers who were not paying enough attention. An rising percentage of incidents on today's roadways may be attributed to driver weariness brought on by sleep deprivation or sleep disorders. A drowsy driving warning system might serve as the foundation for an initiative to reduce collisions caused by sleepy motorists. A model to avoid these mishaps may be produced by this project. We have provided a very easy and cost-effective approach to avoid this. An connected alarm in the back of the car sounds when the driver nods off, alerting them to their dangerous state. The horn will sound for at least 10 seconds to give the driver time to wake up and prepare to regain control of the car. This allows us to prevent catastrophic mishaps..

Key Words: Sensor, IR LED Sensor, Microcontroller, alarm

Introduction

The major goal of the Drowsy Driver Detector is to create a tool that can cut down on the amount of accidents caused by drivers falling asleep at the wheel. Our double-checked vigilance allows for more precise detection. During the detecting phase, the eye blink sensor is always watching for the exact time of an eye blink. It keeps a close watch on every blink. When the monitoring is complete, the data is sent to a microcontroller, which then converts the analog readings into digital form. The microcontroller will provide a warning if the feedback system is activated.

determines the warning signal to sound. This project also deals with temperature sensors; if there is a fire inside the vehicle, the sensor detects it and shuts off the engine, and the second use of this paper is to detect the alcohol content or any leakage of gas from the vehicle. A beeper is used as part of the warning system. The C program is translated into hex code that the microcontroller can understand.

Literature Survey

Methods for Detecting Drowsy Drivers

A number of methods exist for identifying sleepy motorists. Sensing physiological features, sensing driver operation, sensing vehicle reaction, and monitoring driver response are all examples of these methods.

Monitoring Physiological Characteristics

Techniques based on human physiological phenomena are the most accurate of these approaches [5]. Two methods exist for using this strategy: Physical alterations like slouching, head swaying, and eye opening/closing may be measured with changes in physiological signals like brain waves and blinking [5]. The first approach, although providing the most precise results, is impractical since it requires sensing electrodes to be placed directly to the driver's body, which may be uncomfortable and distracting. Additionally, lengthy periods of driving would cause sweat on the sensors, reducing their monitoring accuracy. Since the second method makes use of the non-intrusive optical sensors of video cameras, it is well suited to real-world driving scenarios.

Temperature Sensor

Thermistors are special types of thermally sensitive resistors that vary their electrical

resistance dramatically and predictably in response to changes in ambient temperature. When exposed to a rise in body temperature, Negative Temperature Coefficient (NTC) thermistors show a reduction in electrical resistance, whereas Positive Temperature Coefficient (PTC) thermistors show an increase. tolerance in conditions of extreme heat. The sensor will immediately detect any fire inside the car, protecting the occupants from harm.

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Eye Blink Sensor

In order to power the gadget and trigger actions, blinking eyes are vital to this design. Blink detection must be performed, and for this, we can use pre-existing blink detectors or build our own by writing a set of instructions in image processing that states, "consider an event called "blink" if there is no eye lid movement found for the certain period of pre-determined i.e. time greater than the human eye blinking time." Given that a "blink event" is not the same as the "common eye blinking" that most people are probably thinking of, the time threshold for this project is five seconds.Blink event testing must be conducted, not general eye blinking tests..

Alcohol Sensor

This sensor is installed in vehicles and storage tanks at gas stations to detect the presence of potentially explosive liquefied petroleum gas (LPG). The sensor's high sensitivity and lightning-fast reaction time make it an ideal choice. (3)Iso-butane, propane, LNG, alcohol, and cigarette smoke may all be detected by the sensor. The device is simple to install in an emergency light so that the motorist may see a warning..

IR Sensor

A gadget that sends out infrared radiation is called an infrared transmitter. In a similar vein, an IR receiver is used to pick up invisible infrared signals from an IR transmitter. It's crucial that the IR emitter and receiver be in parallel with each other. When the signal strength is strong, the IR sensor transmits to the IR transmitter, which in turn sends IR rays to the IR receiver. A comparator is linked to the infrared detector. The operational amplifier is linked to the comparator. A reference voltage is applied to the comparator circuit's inverting input terminal.Connecting an infrared receiver to the non-inverting input terminal. The IR receiver stops conducting when there is a break in the IR signal between the transmitter and receiver. The voltage at the comparator's non-inverting input terminal is therefore greater than that at the inverting input terminal. In the +5V range, the comparator output may be found. The microcontroller receives this voltage..

Other Methods

By installing the sensor in front of the driver's seat, the driver's eye movement may be tracked in real time. The motorist will be warned if there is no discernible movement in the driver's eyelid after a certain amount of time. This sensor has to be installed so that it detects the driver's eye movement whenever they lean forward or back.

Aims and Objectives of the study

A microcontroller took the sensor's data and uploaded it to the system that relied on it. With the use of an eyeglass, the IR-Led sensor module may be precisely focused on the eye. To tell the difference between an open and closed eye, the sensor sends two distinct signals. An alarm is set off in the back of the car to alert the driver if the microcontroller analyzes the latest 60 measurements and finds that 10 of them show a closed eye, indicating that the driver is becoming tired. The beeping will keep on for at least 10 seconds, and maybe much longer if the microcontroller fails.

Proposed Methodology

The proposed method is built in four stages and it is applied to the Microcontroller

IR LED focused to the eye.

Photodiode senses the reflected ray and sends a corresponding output to the arduino.

The arduino compares the output with a set threshold and determines eye status.

If „closed eye“ status comes in 10 out of last 60 reading to warn the driver or to wakehim.

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