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Anti-Sleep Alarm using IoT

[1]Prof. Rajnandini Kumawat, [2]Nehal Kawalekar, [3]Rahul Pawar, [4]Sandeep Medar

[12,3,4]Department of Information Technology, ARMIET, Shahpur, Maharashtra, India

A B S T R A C T

There has been a veritably large increase in road accident due to doziness of motorist while driving which leads to enormous fatal accidents. The motorist loses his control when he falls sleep which leads to accident. This is because when the motorist isn't suitable to control his vehicle at veritably high speed on the road. This design can induce a model which can help similar accidents. Temperature detector and bank detector are used for farther safety system in the vehicle. With the prognostications of World Health Organization (WHO) that number of deaths due to business accidents will be around 2 million with lower than 15 times, experimenters currently are paying further attention in how to help in precluding business accidents and lower the number of passed losses. The purpose of this study is an attempt to help business accidents due to fatigue or somnolence. Developed system uses a camera and image processing ways bedded in a jeer pi 3 module to descry motorist's eyes and decide whether the motorist is sleepy or not. Grounded on this decision an alarm system will be actuated. Alarm can be visual, audio and indeed a simple vibration in the steering wheel. Feeling sleepy while driving could beget dangerous business accident. still, when driving alone on trace or driving over a long period of time, motorists are inclined to feel wearied and sleepy, or indeed fall asleep. currently utmost of the products of motorization-sleep discovery vended in the request are simply earphone making intermittent noises, which is relatively annoying and hamstrung. As similar, there's a high demand for cheap and effective motorist sleep discovery. thus, we came up with an idea and successfully developed a sleepy discovery and intimidating system, which could effectively meet this demand.

Keywords: Eye blink sensor, Temperature sensor, Smoke sensor, relays, microcontrollers

1. Introduction

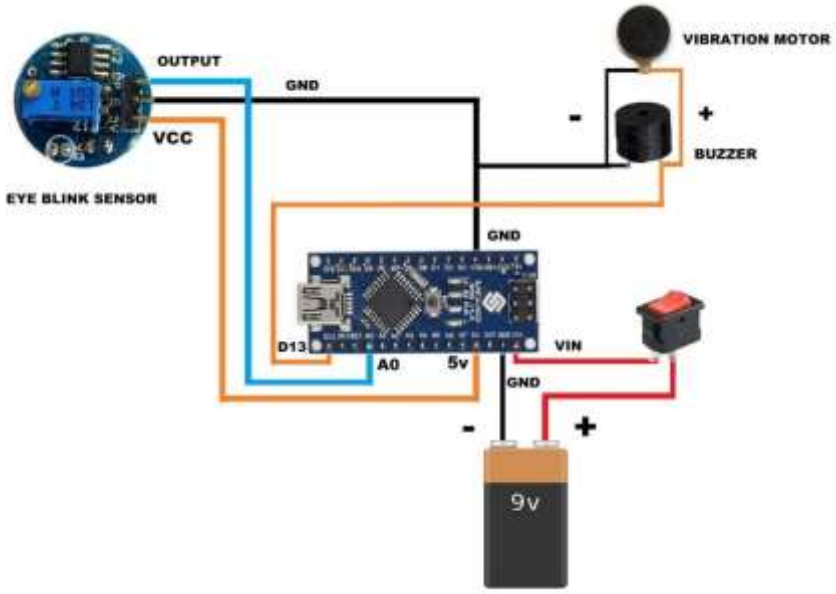
Driver fatigue may be a significant factor in a large number of vehicle accidents. Recent statistics estimate that annually 1,800 deaths and 96,000 injuries are often attributed to fatigue related crashes. consistent with the global status report on road safety given by WHO which reflects information from about 180 countries has indicated that worldwide the total number of road traffic death has plateaued at 1.25 million per annum, with India reporting about 1.34 lakh fatalities in road accidents per annum, an enormous 70percent of them being due to drowsiness. the event of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident-avoidance systems. due to the hazard that drowsiness presents on the road, methods have to be developed for counteracting its affects. The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed on designing a system that will accurately monitor the open or closed state of the driver's eyes in real-time. By monitoring the eyes, it's believed that the symptoms of driver fatigue can be detected early enough to avoid a car accident. Detection of fatigue involves the observation of eye movements and blink patterns during a sequence of images of a face. it'll also send alert to the owner that driver is drowsy. Distraction problem of the driving force can also be solved through this project as it will detect the eye ball movement of the driver and let him/her know that he is not looking in the front and alarm will activate to stop the vehicle. This paperwork is concentrated on the localization of the eyes, which involves watching the entire image of the face, and determining the position of the eyes, by a proposing well image processing algorithm. Once the position of the eyes is found, the system is meant to determine whether the eyes are opened or closed, and detect fatigue. For our project face and eye classifiers are required. So, we used the training objects method to create our own hear classifier files. If detected then alert are going to be sent to both the driver and owner of the vehicle and alarm will ring to wake up the driver asking him to stop the vehicle.

2. Existing System

The photo diode is placed just next to the IR LED in such a way that it cannot receive IR rays directly. Photodiode is sensitive to the IR radiation. Its cathode connected to the positive voltage i.e., 5volt and anode connected to the noninverting input of the Opp-amplifier which also get pulled down though the 10Kilo ohm resistor. Potentiometer in IR sensor is use to set the sensitivity distance of the sensor, it connected to the inverting input of the Opp-amplifier. IR LED continuously transmit the infra-red rays and if any object comes in front of it, IR rays get reflected back and it received by the photo diode due to this change in IR radiation the voltage at the anode get change, the change in anode voltage is depend on the IR radiation received by the photo diode. More the IR radiation received grater will be the change in anode voltage. We can adjust the sensitivity distance by rotating the potentiometer on the sensor, we rotate the potentiometer that means we set a threshold voltage for the noninverting input of the Opp-amplifier. Whenever the voltage on the noninverting input is greater than the threshold voltage, the voltage on the noninverting input i.e., +ve voltage from the photodiode get forwarded and get the positive pulse at the output of the Opp-amplifier i.e., output of the sensor.

3. Methodology

A device for keeping awake a person that is about to fall asleep, comprising a pair of glasses with a frame that has two arms, at least one sensor for detecting the movements of an eye blink, at least one battery, and at least one electrode for issuing an electric pulse. Preferably, the at least one sensor, battery and electrode are implanted into the frame at the level of both arms of the pair of glasses, wherein it is even more preferred that the at least one electrode is located in an area of the arms of the pair of glasses, to enable a download on the parietal area of the skull of a wearer. Providing all the elements of the device within the regular frame of a pair of looking glasses make the device extremely easy to handle and to operate, as it can be handled exactly like any other pair of glasses. To this extend, the device according to the present invention may be provided with neutral, graduated or darkened lenses. The sensor can detect the movements of the eye blink, considering the frequency of opening and closing of the upper eyelid. Several studies have shown that in a person who is about to fall asleep, the blinking tends to be more frequent, reaching a threshold of about 15-20 episodes per minute, while at the same time increasing the wink frequency with an eyelid closure duration higher than 0,03 msec. A narrow-band light beam from this emitter is aimed across the surface of the driver's eye, just above the eyeball, between the eyelids, and it is sensed in the opposite corner of the eye by means of a light sensor, which has a narrow band light filter mounted in front of it. For waking up the driver, whose eyes have been closed for a longer time period than about one second or less, an electronic circuitry is activated by means of the closed-eye signal from the light sensor, turning on an alarm signal, a buzzer or similar, after a one second or shorter time delay. A pair of eyeglasses include a sensing lever that is in constant contact with one of the driver's upper eyelid muscles. Downward motion of the eyelid moves the sensing lever downward and actuates a microswitch that is coupled to the sensing lever. A normal blink of a driver's eye does not produce an audible alarm. However, if the driver's eyelid fails to open in a predetermined time, the audible alarm will sound. As soon as the driver's eyelid opens, a yellow caution light and the audible alarm are reset. Normal eye blinks produce illumination of the yellow caution light in view of the driver, thereby assuring the driver that the sleep awakening device is functioning properly.



4. Conclusion

This review has provided an initial evaluation of sleepiness detection devices. Although many devices for detecting sleepiness are available, most proved unsuitable for detecting sleepiness in drivers, due to a variety of factors, such as insensitivity to the early stages of sleepiness, intrusiveness and assumed driver acceptance issues. The following conclusions may be drawn from the review: – no single method exists that is commonly accepted to detect driver fatigue in an operational context; – the review has identified sleepiness detection devices that are available commercially or as prototypes for use in drivers, and has analyzed the scientific evidence for their effectiveness to warn drivers of sleepiness; – following categorization of the devices according to their basis of operation (for example, physiological, steering wheel movements or model-based), it was concluded that those based on physiological measures such as the EEG and skin resistance are too intrusive, and that measures of physical activity such as wrist or head movement not sufficiently sensitive; – some devices based upon measures of eye activity were considered to be suitable, depending on the way in which measures were taken, and those considered as potential candidate devices for further evaluation have been identified; – few empirical studies have previously undertaken an independent comparison of actual devices; – the use of model-based techniques to identify the increased likelihood of sleepiness is a promising approach, particularly when used in combination with other real time measures such as eye activity and steering wheel movements. A subset of 15 devices was identified as potentially being worthy of subsequent evaluation. These included devices based on eye movements, driver behavior (including steering and lane deviations), model-based, and on combinations of variables.

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