Accident avoidance using autonomous emergency breaking system and drowsiness detection

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ABSTRACT

This an approach for detecting eye blink of a person and autonomous breaking system for accident avoidance. Our proposal consists of two stages, the first stage is to detect eye blink of a driver driving a car. The next stage is to avoid the accident by giving an indication that some object is coming from either side. We are using IR sensors, Arduino and ultrasonic sensors for eye blink and accident avoidance respectively. Driver fatigue is one of the major causes of accidents in the world. Detecting the drowsiness of the driver is one of the surest ways of measuring driver fatigue. In this project, we aim to develop a prototype drowsiness detection.

Keywords: *Eyeblink, IR sensor, Ultrasonic sensor, Drowsiness.*

1. INTRODUCTION

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 is 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 blinks of the eyes. The accident avoidance system helps to avoid the regular accidents that will normally occur on highways and in city traffic. These accidents are mainly happened by distraction, unconsciousness, and distance unknown between our vehicles. So let us consider the Indian roads and we will have 2 ultrasonic sensors where one is placed in the front and another one behind the car. Due to this sensor, we can calculate the distance of other automobiles nearing us. Thus we can locate other cars and we can protect ourselves from accidents.

Nowadays the number of accidents are increasing at higher rates. The count of accidents at present is 4,80,652.So to avoid this accident we have introduced this system.In this system, we have made autonomous emergency breaking system which the first part and the second part is that accidence avoidance using eye blink detection. The focus will be placed on designing the system that will accurately detect the open or close state of the drivers is in real time.

2. BLOCK DIAGRAM
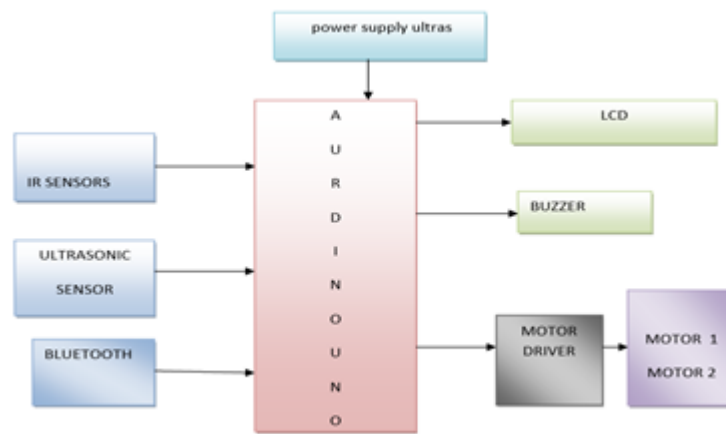
This system works by monitoring the eyes of the driver and sounding an alarm when he/she is drowsy and the second part is accidence avoidance using autonomous emergency breaking system. The system so designed is a non-intrusive real-time monitoring system. The priority is on improving the safety of the driver without being obtrusive. In this project, the eye blink of the driver is detected and also the obstacles in front and backward of our car. If the driver's eyes remain closed or if the eye blinks for more than a certain period of time, the driver is said to be drowsy and an alarm is sounded. Driver fatigue is a significant factor in a large number of vehicle accidents. Recent statistics estimate that annually 1,200 deaths and 76,000 injuries can be attributed to fatigue-related crashes. The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because of the hazard that drowsiness presents on the road, methods need to be developed for counteracting its effects.

The aim of this project is to develop a prototype drowsiness detection and obstacle 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 and the obstacle coming from either side. By monitoring the eyes, it is 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 blink. The procedure used was the geometric manipulation of intensity levels. The algorithm used was as follows. First, we input the IR sensor using the goggles near the driver's eyes.

Components are the Arduino, LCD, ultrasonic sensor, LED used for the detection of obstacle coming from either side. Ultrasonic sensor fixed in our car and it normally senses the car which is nearest to us on both front and back side. At the distance of 30 cm, the green color light will show the notification. When the car between the yellow color light alerts reaches us. When the car reaches at the distance of 10 cm the red color light alerts us we are in danger zone. The distance between one vehicle and another vehicle was displayed in LCD. There is no notification takes thus it denotes we are on the safer side.

Arduino is a prototyping platform for controlling many devices. Through Arduino, we can build many prototypes that we imagine. A basic Arduino kit which forms the connection between the LCD and Ultrasonic sensor. Here the LCD is the source to display the output. Through this LCD display, we can be able to see the distance of the vehicles that come. The ultrasonic sensor is to sense the vehicles that near about to 10 meters Bread boards which allows implementing all the connections accompanied by the three LEDs.

3. WORKING

The basic idea behind this project is to avoid accidents. It is a precautionary measure that alerts the driver .the initial stage begins from the ultrasonic sensor that identifies the vehicle in the front and back side. If the car reaches 30 cm green color light will glow that will show the notification. At 30 cm distance, the yellow color light will alert us. When it reaches 10 cm distance red color light will alert us we are in danger zone. At the same time, the distance between one vehicle and another vehicle was displayed in LCD. Wire connections are made from the bread board to the LCD. The LCD and other devices are connected to the Arduino kit. This project will make the easy calculation of a distance between one vehicle and another vehicle for the driver. And the accident can be also avoided by detecting the eye blink of the driver by placing IR sensors on the goggles. If the eyes of the driver remain closed for more time or if the driver's eyes blink more times for a certain period then the driver is sleepy. This will be detected by the IR sensors and the message will send to the controller and the controller will start the buzzer and the buzzer will alert the driver that he or she is sleepy so stop the car. In this way, a car accident will be avoided.

4. CONCLUSION AND FUTURE WORK

In this paper, we proposed and implement the accident avoidance system. Using this system we may avoid many accidents happened due to the following system.The system comprises very low-cost components such as an ultrasonic sensor, LCD, and LEDs, Arduino, web cam, Bluetooth module etc. This system might have many advantages such as: - Use to know the distance about the following the vehicle and whether the driver is sleepy. In future, we are going to reduce the speed of one vehicle according to the following distance of another vehicle. By this system, we may prevent many accidents and INDIA will become an accident less country

5. REFERENCES

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