

Automatic Breaking System Using Eye Blinking Sensor

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Abstract: The aim of this project is to design an Accident Prevention System which helps in preventing/avoiding accidents. Accident due to cause of drowsy is prevented and controlled when the vehicle is out of control. The accidents due to the drowsy state of the driver is prevented using automatic breaking system by using eye blink sensor. The term used here for the realization that the driver is drowsy is by using eye blink sensor of the driver. In recent times drowsiness is one of the major problem of highway accidents. These types of accidents occurred caused by drowsy and driver can't able to control the vehicle, when the driver wakes. The drowsiness is induced by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame or IRS. If the driver is drowsy, then the system will give buzzer and the speed of the vehicle is reduced in 3 to 5 sec.

Keywords: INFRARED SENSOR (IRS), HRL, SUV, NHTSA, DC GUN.

1. INTRODUCTION

Driving to reduced time, and money in spite of the conditions around you and the actions of others. This is the slogan for justifiable Driving. Vehicle accidents are most common if the driving is inadequate. These happen on most factors if the driver is sleeping or if he is alcoholic. This Paper was focused mainly on road accidents occurring due to worst condition of signboards, drowsy state and drunken state of drivers in four wheelers. As the fatality rates due to growth of accidents day by day, the below methods are implemented to decrease the fatality rate. Driver drowsiness is recognized as a crucial aspect in the vehicle accidents. It was demonstrated that driving performance deteriorates with increased sleepiness with resulting crashes constituting more than 20 percent of all vehicle accidents.

But the life lost once cannot be re-winded. Advanced technology over's some hope avoid these up to some extent. This project involves measure and controls the eye blinking using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reacted infrared rays of eye. If the eye is closed means the output of IR receiver is high other side the IR receiver output is low. This to know the eye is closing or opening Position. This output is given to circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is in vehicle where if anybody loses conscious and indicate through alarm. Then eye blinking sensor transfer signals to the dc motor and it starts dc gun which apply on the break and vehicle will be stops gradually in 3-5 sec.

2. HISTORY

The world's first demonstration of forward collision avoidance was performed in 1995 by a team of scientists and engineers at Hughes Research Laboratories in Malibu, California. The project was funded by Delco Electronics, and was led by HRL physicist Ross D. Olney. The technology was labelled for marketing purposes as FOREWARN. The system was radar based - a technology that was readily available at Hughes Electronics, but virtually no place else in the world. A

small custom fabricated radar-head was developed specifically for this automotive application at 77 GHz. The forward radar-head, plus the signal processing unit and visual-audio-tactile feedbacks were first integrated into a Lexus SC400, and shortly thereafter into a Cadillac STS An SUV-style concept vehicle known as SSC (Safety Security & Communications), that contained many other of Delco's most advanced technologies also received the FOREWARN collision avoidance system and was shown to the public for the first time at the North American International Auto Show at Cobo Hall in Detroit in 1996. This was a fully functional vehicle, and demonstrations were concurrently being provided by a duplicate vehicle. While primarily a warning system, with various feedbacks, the system did have minor control of the brakes which were pulsed to begin a braking action in the event of a potential collision, making it also the beginning of avoidance systems. These SSC vehicles were sent around the world, including Europe and Asia, to share this very important life-saving technology with all the major automotive manufacturers in an effort to quick-start their individual development efforts. It took almost 20 years for this important technology to reach the consumer marketplace.

In the early-2000, the U.S. National Highway Traffic Safety Administration (NHTSA) researched whether to make frontal collision warning systems and lane departure warning systems mandatory.

In 2011, a question was submitted to the European Commission regarding stimulation of these "collision mitigation by braking" systems. The mandatory fitting of Advanced Emergency Braking Systems in commercial vehicles will be implemented on 1 November 2013 for new vehicle types and on 1 November 2015 for all new vehicles in the European Union. This could, according to the impact assessment, ultimately prevent around 5,000 fatalities and 50,000 serious injuries per year across the EU.

A 2012 study by the Insurance Institute for Highway Safety examined how particular features of crash-avoidance systems affected the number of claims under various forms of insurance coverage. The findings indicate that two crash-avoidance features provide the biggest benefits: (a) *autonomous braking* that would brake on its own, if the driver does not, to avoid a forward collision, and that would shift the headlights in the direction the driver steers. They found lane departure systems to be not helpful, and perhaps harmful, at the circa 2012 stage of development.

WORKING:

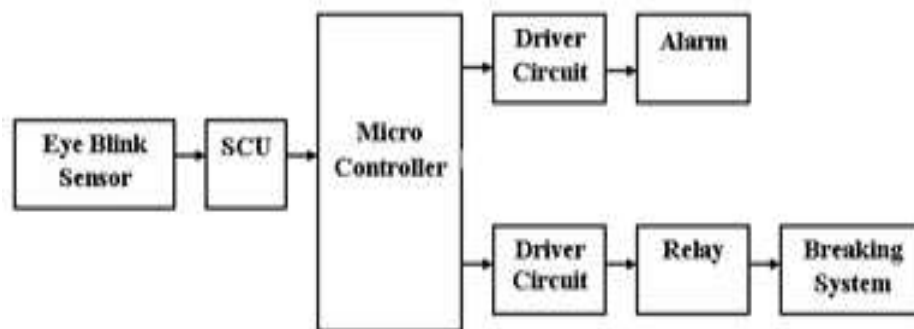


Fig 1: Block Diagram of Actual Process

This is because of the fact that the driver is not able to control his vehicle when he is asleep and by the time he realizes and there is an accident. The vehicle is at a very high speed on highways due to which handling is tough and getting the vehicle to halt in such a condition is very difficult. Due to this many automobile companies are trying to research onto how an accident which caused due to driver fatigue can be prevented. In this project we will generate a model or system which can prevent such an incident. The Purpose of such a model is to advance a system to detect fatigue symptoms in drivers and reduced the speed of vehicle to avoid accidents. The main components of the system consists of an eye blinking sensor for the driver blink acquisition and an adaptive speed controller designed using stepper motor for providing the accurate positioning of the throttle valve to control the speed of vehicle.

EYE BLINK DETECTION:

It is compulsory in our working to detect the blinking of eye, since it is used to drive the device and to operate events. Therefore the blink detection has to be done, in which we can avail readily available blink detectors in market or we can

integrate it with a special instruction written in image processing that, if there is no pupil found for the particular period of pre-determined i.e. time greater than the human eye blinking time then consider an event called “blink”, for which the group of operations will be followed. We need to perform testing for only blink event estimation, and not to find normal eye blinking.

It is vital within our trying to discover the flashing of eyes, because it is utilized to push product and also for run occasions. Therefore blink recognition needs to be carried out, which is why we are able to get easily approachable blink sensors in marketplace or we are able to include it having a unique instruction created in image processing which, when there is absolutely no pupil discovered for your particular amount of pre-determined. Electronic Period more than our eyes blinking period then think about a meeting known as “blink”, which is why the actual set of procedures is going to be implemented. Right here, in this instance we have to managed time because 1st & 2nd or over this, because “blink event” differs through “normal eyes blinking”. We have to carry out this testing for just blink occasion evaluation, and never to discover regular eye flashing.

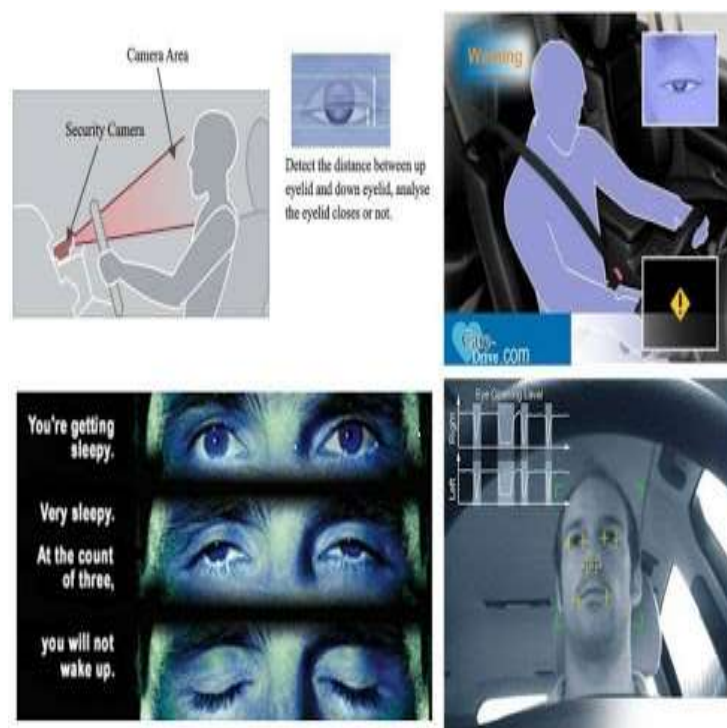


Fig 2: Image Processing of Drowsiness

BREAKING SYSTEM:

The breaking system is the main component in this project. The breaking system has a tyre in which it rotate in its axis and also a D.C gun which works according to the working of the command of the microcontroller. The breaking system breaks the vehicle when the driver circuit gives information to the breaking system.

The breaking system is consists of a wheel, in which the wheel is connected to a 1500 rpm motor for the wheel rotation. The wheel rotates in its axis and for the breaking there is a D.C gun connected to the system. When the circuit gives information to the D.C gun it ejects and stoops the wheel from rotation and thus break is applied.

Parameter	Value
SPEED	1500 RPM
VOLTAGE	12 VOLT
WATTS	18 WATT
TORQUE	5720 NM

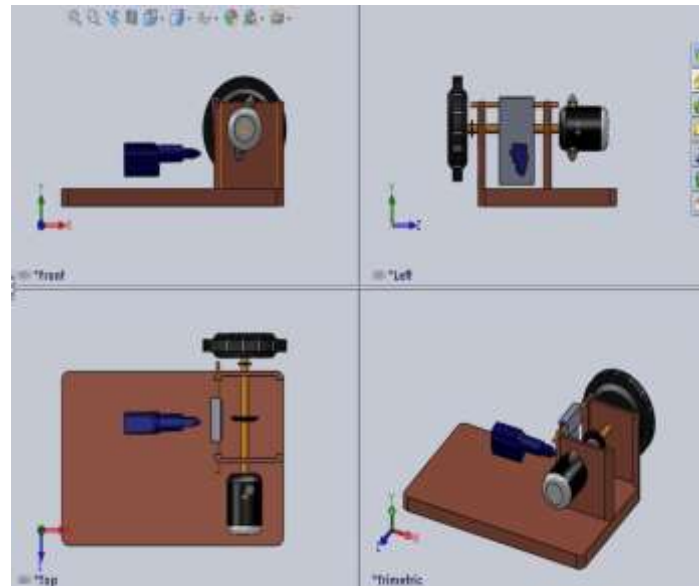


Fig 8: All Views of DC Gun

BREAK:

The breaking system had some noise and it was analysed by running it and then it was rectified that it is the mistake of the flange and the flange was changed and then it was well working, but another problem occurred is that to avoid the friction between the flange and the wheel a material should be kept. Then it was rectified and given correct position. The break is applied in 3 seconds.

DC GUN:

The gun was working well but after some time the gun got burned and then it was rectified. It is then identified as the gun is six volt but high current was going in so it was burned. Then a separate capacitor is fixed on the circuit board. After that it was working well. The gun was somewhat away from the flange so it was rectified and kept closer. The gun is activated in three seconds.

3. SPECIFICATION OF THE MOTOR

FUTURE SCOPE:

- If we Use GPS & GSM exact location of the Car can be traced on MAP.

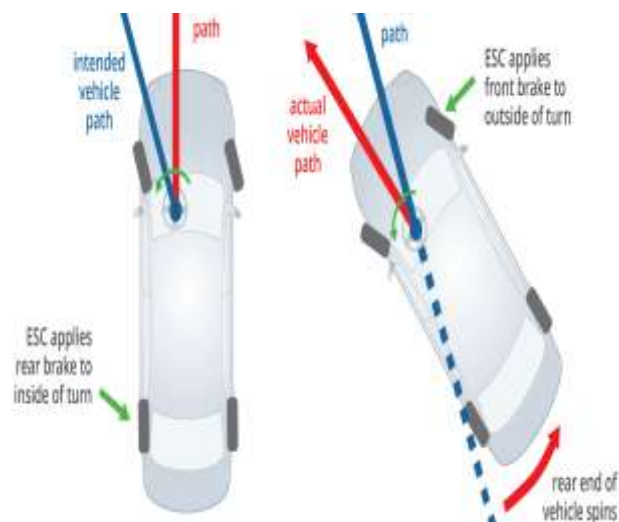


Fig 3: Automatic Steering System

- As the car get suddenly or gradually stop then there will be chances of accident by back side cars.
- If we use the steering system for this which move at left side during breaking then it will reduce the accident.

4. CONCLUSION

Actually the fact that the driver is not able to control his vehicle when he is asleep and by the time he realizes it, there is an accident. The car is at a very high speed on highways due to which handling is tough and getting the vehicle to halt in such a condition is very difficult. Due to this many automobile companies are trying to research onto how an accident which cause due to driver fatigue can be prevented. In this project we will generate a model which can prevent/avoid such an incident.

The Purpose of such a model is to advance a system to detect fatigue symptoms in drivers and control the speed of vehicle to prevent accidents. The main components of the system consists of an eye blink sensor for driver eye blink acquisition and an adaptive speed controller designed using stepper motor for providing accurate positioning of the throttle valve to control the speed of car or any vehicle. Advanced technology offers some hope avoid these up to some type of extent. This project involves in measure and controls through alcohol sensor and eye blink using IR sensor.

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