

ACCIDENT PREVENTION IN VEHICLE WITH EFFECTIVE RESCUE OPERATION

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ABSTRACT

Aims:In recent times, drowsiness & sudden heart attack is one of the major cause for highway accidents. Accidents due to drowsiness and sudden heart attack are prevented and controlled when the vehicle is out of control. In this project, in addition to prevention mechanism we presented some immediate rescue operation by transmitting the driver status to nearby hospital or hotel using GPS technology (i.e. WSN inbuilt in vehicle). **Materials and methods:** The term used here for the recognition that the driver is drowsy or physically not good (i.e. low heart beat level) is by using eye blink sensor, heart beat sensor. These types of accidents occurred due to driver can't able to control the vehicle, when he/she wakes. When either heart beat sensor or eye blink sensor activates, then the vehicle is slow down by auto steering mechanism. In-addition to it, the WSN built-in the vehicle transmits the driver status (i.e.) drowsy or sudden stroke to connected server end (i.e. nearby hospital with the help of GPS technology). **Results:** In server side a simple VB application is created which displays the eye position and heart beat level along with latitudinal and longitudinal value of the vehicle. **Conclusion:** It is also possible to control the vehicle from server end that is by start and stop signal, this is done with the help of WSN. This method used to drive car safely and effectively by rescue operation. EALs are capable of determining the working length of the HRF and that Root ZX showed a higher accuracy rate in detection of simulated horizontal root fractures. It should be emphasised that the results obtained in this in vitro study cannot be directly extrapolated to the clinical situation, but can provide an objective examination of a number of variables that are not practical to test clinically.

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KEY WORDS

Drowsiness detection, heart beat level detection, WSN in vehicle, Automatic movement control, GPS technology.

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INTRODUCTION

“Driving to save lives, time, and money in spite of the conditions around you and the actions others.” This is the slogan for Defensive Driving. Vehicle accidents are most common if the driving is inadequate. These happen on most factors if the driver is drowsy or if he is alcoholic. Driver drowsiness is recognized as an important factor in the vehicle accidents. It was demonstrated that driving performance deteriorates with increased drowsiness with resulting crashes constituting more than 20% of all vehicle accidents. But the life lost once cannot be re-winded. Advanced technology offers some hope avoid these up to some extent. This project involves measure and controls the eye blink using IR sensor and heart beat level using PULSE OXIMETERSENSOR. TheIR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. PULSE OXIMETER SENSOR is designed to give digital output of heat beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heartbeat. This digital output can be connected to microcontroller directly to measure the Beats per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse. Output from both sensors are summed up and given to the logic circuit to indicate the final output (i.e.) to transmit driver status to connected nearby hospital or hotel (server side). By using wire-less technology if the driver gets a heart attack or he is drunk it will send signals to nearby hospital to indicate the driver status [1].

This project involves controlling accident due to unconscious through Eye blink and heart beat level. A car simulator study was designed to collect physiological data for validation of this technology. Methodology for analysis of physiological data, independent assessment of driver drowsiness and development of drowsiness detection algorithm by means of sequential fitting and selection of regression models is presented. We can automatically park the vehicle by first using Automatic braking system, which will slow down the vehicle and simultaneously will turn on the parking lights of the vehicle and will detect the parking space and will automatically park the car preventing from accident. By using wire-less technology such as Car Talk2000 if the driver gets a heart attack or he is drunk it will send signals to vehicles nearby about this so driver become alert. [2]

Sleep related accidents tend to be more severe, possibly because of the higher speeds involved and because the driver is unable to take any avoiding action, or even brake, prior to the collision. Horne describes typical sleep related accidents as ones where the driver runs off the road or collides with another vehicle or an object, without any sign of hard braking before the impact. Accidents are also caused when street lights are out especially on highways, long distance routes [3]. Here, usually the upper dipper lights are in upper mode. So, when the driver fails to change the mode of the light and at the same time when the car comes from the opposite side. it causes the opposite driver to miss the judgment and gives rise to accident. Accidents are also caused due to the intruders coming suddenly in either side of the vehicle i.e. front, left or right. Due to which the driver misses the judgment and meets with an accident. The Objective of this project is to develop a system to keep the vehicle and driver lifeseure and protect it by the occupation of the intruders [4].

Contributions:This paper makes the following contributions:

Formal model of Vehicle section: We develop a formal model of vehicle section which shows the overall model of the system. It contains heart beat sensor and eye blink sensor to monitor the humans.

Modular analysis: We show how to calculate the heart beat and to measure the eye movement of the human being.

Implementation: We develop a prototype model and if any abnormal movement is captured by the sensors and information are signals are transmitted to warn the human beings in order to avoid accidents.

Experiments: We present results from experiments from the overall hardware representation and if any accident is occurred the information if transmitted to the nearest hospital through GPS system.

RELATED WORK

Driver drowsiness resulting in reduced vehicle control is one of the major causes of road accidents. Driving performance deteriorates with increased drowsiness with resulting crashes constituting 48% of all vehicle accidents. The vehicle crashes result in more than 1500 fatalities, 71 000 injuries, and an estimated \$12.5 billion in diminished productivity and property loss. Many efforts have been made recently to develop on-board detection of driver drowsiness. A number of approaches have been investigated and applied to characterize driver drowsiness using physiological

RELATED WORKS ON VEHICLE CONTROLLING

A driver state of drowsiness can also be characterized by the resulting vehicle behavior such as the latera position, steering wheel movements, and time-to-line crossings whom correspondence should be addressed not intrusive, they are subject to several limitations related to the vehicle type, driver experience, and geometric characteristics and condition of the road. Among these various possibilities, the monitoring of a driver's eye state by a camera is considered to be the most promising application due to its accuracy and Non-intrusiveness. The driver's symptoms can be monitored to determine the driver's drowsiness early enough to take preventive actions to avoid an accident [5].

Though many studies have developed image-based driver alertness recognition systems using computer vision techniques, many problems still remain. First, eye detection remains a challenging problem with no inexpensive or commercial solutions. For some applications, eye feature detection can be satisfactory, but these only used frontal

face images taken with controlled lighting conditions. In a car, the constantly changing lighting conditions cause dark shadows and illumination changes, such that effective techniques in stable lighting often do not work in this challenging environment. The performance of current algorithms degrades significantly when tested across different postures and illumination conditions, as documented in a number of evaluations. A second problem is that current systems do not use identification and correlation analysis of various visual measures. Typical visual characteristics of a driver with a reduced alertness level include longer blink duration, slow eyelid movement [6].

DROWSINESS FEATURES

The drowsiness features are characterized by the blinking frequency of the eye by the driver.

- *Awake-conscious-normal
- *Drowsy-less conscious-risky
- *sleep-out of conscious-at extreme risk

PROPOSED SYSTEM

The total essence and the functioning of the vehicle section is represented in the following block diagrams [7]. These block diagrams mainly consist of 9 parts. They include

- Eye Blink Sensor
- Heart beat sensor
- LCD
- AT89S52 Microcontroller
- Buzzer
- Relay
- DC Motor
- UART
- WSN
- GPS

In block diagram there is two section, namely

- Vehicle section
- Monitoring and controlling unit

Hence a circuit diagram for both the units are illustrated with clear interfacing unit.

VEHICLE SECTION

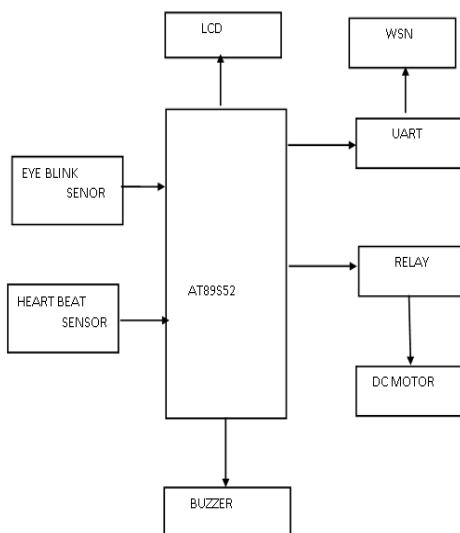


Fig:1. Vehicle section

In vehicle diagram, it contains heart beat sensor, eye blink sensor which transmit signal to microcontroller to process further information. The microcontroller reads the sensor value and produce buzzer alarm along with auto parking of the vehicle. [8]

MONITORING AND CONTROLLING

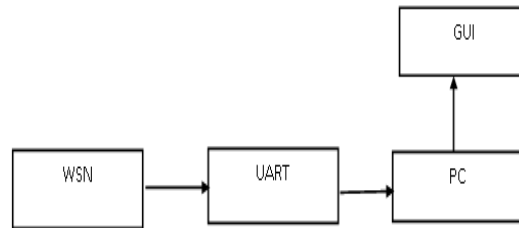


Fig: 2. Monitoring and Controlling section

In controlling side, a simple visual basic is created which displays the driver status i.e. driver's heart beat level and eye blink position (opened or closed) [9]. It not only indicates sensor value instead it is also possible to indicate the vehicle location i.e. Latitudinal and longitudinal value to the server end with the help of GPS technology.

Screenshot of visual basic application is shown below.



Fig: 3.Result Analysis

CONCLUSION

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 difficult. Due to this many automobile companies are trying to research onto how an accident which occurs due to driver fatigue can be prevented.

In this project we will generate a model which can prevent 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 avoid accidents. The main components of the system consist of an eye blink sensor and heart beat sensor for driver blink acquisition. It also holds main part of GPS used to link Google server to transmit the vehicle location. Advanced technology offers some hope avoid these up to some extent.

FINANCIAL DISCLOSURE

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CONFLICT OF INTERESTS

There is no conflict of interest amongst the authors.

REFERENCES

- [1] Y Wang, J Yang, H Liu, Y Chen, M Gruteser, RP Martin. [2013] Sensing Vehicle Dynamics for Determining Driver Phone Use, *MobiSys*.
- [2] H Yan, EC McLaughlin, J Hanna. [2013] Loss of 19 firefighters in Arizona blaze 'unbearable,' governor says
- [3] J Yang, S. Sidhom, G. Chandrasekaran, T Vu, H Liu, N Cecan, Y Chen, M Gruteser, RP Martin. [2011] Detecting Driver Phone Use Leveraging Car Speakers. *MobiCom*
- [4] J. Lindquist, J Hong. [2011] Undistracted Driving: A Mobile Phone That Doesn't Distract HotMobile.
- [5] TEXIEVE: Detecting Drivers Using Personal Smartphones by Leveraging Inertial Sensors. C Bo, X Jian, XY Li. [2010]
- [6] J Palmer. [2009] Robot Firefighting team debuts,
- [7] JBAMuintz, MA Viergever. [1998] An overview of medical Image Registration Methods, 9-12
- [8] LGBrown. [1991] A survey of Image Registration Methods. 29-37
- [9] Prevention of Accident Due to Drowsy By Using Eye Blink, B. praveenkumar, K. Mahendranan, ISSN: 2319-8753
- [10] Design Of Accident Prevention System Using QRD 1114 and CNY 70 Sensor, p. kadam, kavita. ISSN: 2250-2459
- [11] Yang Jie et al, Sensing Driver Phone Use With Acoustic Ranging through car speaker. *IEEE Transaction on mobile computing*, (volume 11, issue: 9) 2012
- [12] DF RC. Ltd, "Firefighting robot," brochure.
- [13] MVF-5, "Dok-ing," website, 2013. [Online]. Available: <http://www.rylandresearch.co.uk/remotely-operated-vehicles/firemote-4800>
- [14] www.osun.org/pdf/microcontroller
- [15] www.electonicsforu.com/voisceeic.pdf
- [16] <http://www.eng.chula.ac.th/files/langearforum/download/langearforum2553/CarTalkITS.pdf>