ISSN : 2321-9602

Indo-American Journal of Agricultural and Veterinary Sciences




editor@iajavs.com
iajavs.editor@gmail.com

Indo-Am. J. Agric. & Vet. Sci., 2021 ISSN 2321–9602 www.iajavs.com

Indo-American Journal of Agricultural and Veterinary Sciences

Vol. 9, Issue 4, Nov 2021

A ASSESSMENT TABLOID ON DROWSINESS DETECTION & ALARM SYSTEM FOR DRIVERS

VINNAKOTA DEVI*, T.VENKATARATNAM**

PG SCHOLAR*, Assistant Professor**

Nova College of Engineering And Technology,Jupudi(V), Ibrahimpatnam(M), Krishna (Dt) – 521456

ABSTARCT:

When we travel or drive, our first concern is for our own safety. When a motorist makes a mistake, it may result in serious bodily harm, even death, as well as substantial financial damage. In today's market, there are a variety of devices, such as navigation systems, different sensors, and so on, that make driving easier for the driver. Road accidents are caused by a variety of factors, including human mistake. According to recent statistics, the number of people killed or injured in car accidents has increased dramatically in the United States. The most common cause of car accidents on the highway is fatigue and sleepiness on the part of the driver. When a motorist begins to nod off, it is imperative that a reliable method be developed for detecting sleepiness. These measures might prevent a significant number of accidents. In an effort to limit the number of accidents caused by fatigue, we test alternative concepts for detecting sleepiness.

INTRODUCTION

It's become a national crisis to see the frequency of car accidents rise as drivers' attention spans shorten. a significant issue facing our civilization. In certain cases, the driver's medical condition is to blame for these incidents. Most of these incidents are caused by driver exhaustion or sleepiness, however this is not the only factor. Fatigued drivers are more likely to be involved in catastrophic car accidents that result in significant injury or death. Drowsiness is thought to be a factor in 30 percent of all car accidents. More than 20% of all automobile accidents are caused by drowsy driving, according to a study. The traditional mode of transportation is no longer enough for today's needs. To determine whether or whether a driver is fatigued, a variety of methods may be used. Techniques based on image processing, electroencephalography, and artificial neural networks, as well as vocal and vehicle-based methods are all examples of this kind of technology. Techniques based on image processing may be broken down into three groups. Template matching, eye blinking, and other techniques are included in this section.method based on yawning. Computer vision and image processing are the foundations of these methods. Researchers often employ computer vision to identify driver fatigue by observing subtle changes in the driver's facial expressions, such as blinking eyes and head motions. This document discusses many methods for detecting sleepiness that have been investigated.

1.1 **VARIOUS DROWSINESS DETECTION TECHNIQUES Researchers employ five different** methods to look for signs of sleepiness, as indicated in fig. 1. I) Techniques based on image processing II) Techniques based on an artificial neural network In addition, there are EEG (electroencephalograph) based methods.

IV) Using a vehicle 5. Measures for singing. In the next section of the study, we'll discuss these

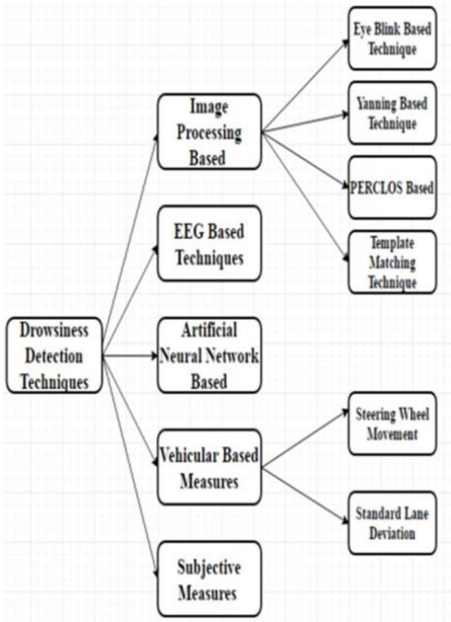

Fig: **Various Drowsiness Detection Techniques**

2. IMAGE PROCESSING BASED TECHNIQUES In image processing based approaches, drivers face pictures are employed for processing so that one may determine its statuses. From the facial picture one may detect if driver is awake or asleep. Using identical photos, they can determine sleepiness of driver since in face image if driver is sleeping or dozing then his/her eyelids are closed in image. And additional indicators of tiredness may be recognised from the facial picture. We may group these strategies in three sub- divisions.

3. 2.1 EYE BLINKING BASED TECHNIQUE In this eye blinking rate and eye closure time is examined to identify

4.driver's sleepiness. Because the driver felt drowsy at that moment his/her eye blinking and stare between eyelids are different from typical settings thus they readily identify sleepiness. In this technique the location of irises and eye states are tracked over time to determine eye blinking frequency and eye closure duration. [16]. And in this sort of system employs a remotely positioned camera to gather video and computer vision algorithms are then employed to successively localise face, eyes and eyelids locations to determine ratio of closure. [17] . Using this eyes closure and blinking ratio one may identify tiredness of driver.

7.

8. 2.2 TEMPLATE MATCHING TECHNIQUE In this method, one may utilise the states of eye i.e. if driver shuts eye/s for some specified duration then system would emit the alert. Because in these ways system has both close and open eyes template of driver. This system may also be taught to acquire open and closed eye templates of driver. This approach is straightforward and quick to execute since templates of both open and closed eye states

9.

10. 2.3 PERCLOS TECHNIQUE PERCLOS is an established parameter to detect the amount of tiredness. The PERCLOS (the proportion of time that an eye is closed in agiven duration) score is assessed to determine if the driver is at sleepy state or not. On an average person blinks once every 5 seconds (12 blinks each minute) (12 blinks per minute).

11. 10.1 YAWNING BASED TECHNIQUE Yawn is one of the signs of weariness. The yawn is expected to be portrayed with a big vertical mouth opening. Mouth is wide open is greater in yawning compared to speaking. Using face tracking and subsequently mouth tracking one may detect yawn. In article [7], they identify yawning based on opening rate of mouth and the quantity When yawn is detected by system then it warn the driver. Instead of utilising only one approach to identify tiredness of driver, several researchers [1, 2, 3] have merged multiple vision based image processing techniques to have superior performance.

12. 11. **VEHICULAR BASED METHODS**

13.

14. Another way for monitoring driver tiredness includes vehicle-based measurements. In majority of the instances, these measures are established in a simulated environment by installing sensors on different car components, such as steering wheel and the accelerator

pedal; the signals generated by the sensors are then evaluated to assess the amount of sleepiness. Some study showed that sleep deprivation may

result in a larger variability in the driving speed [13]. However, the two most commonly used vehicle-based measures are the steering wheel movement and the standard deviation of lane position

PROPOSED METHOD:

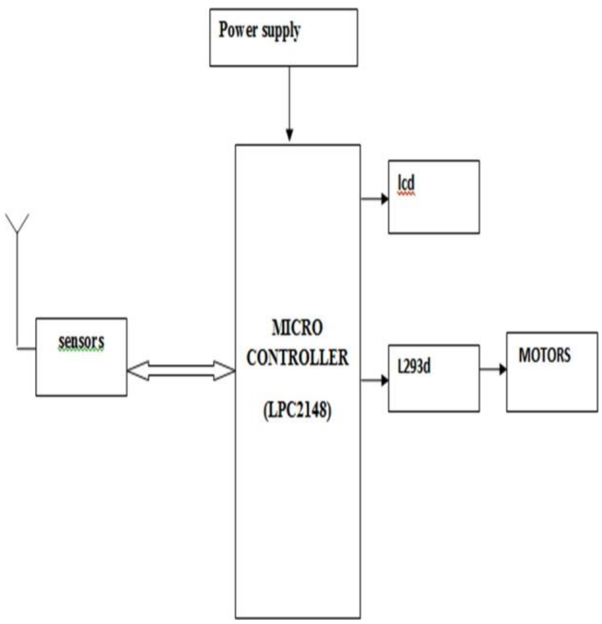

Fig :Block Diagram

The use of an infrared sensor to monitor and adjust the blink rate of the eyes is fundamental to this research. Infrared photons are sent to our eyes by the IR transmitter. The reflected infrared photons from the eye are picked up by the IR receiver (in fig 1). As long as the eye is closed, then the IR receiver's output will be high, else, it will be low. This is how you can tell if the eye is shutting or opening. """"""""""""
the logic circuit may be used to signify an alert. Using the blink of an eye, this initiative aims to prevent an accident caused by a person's unconsciousness. An eye-blink sensor has been installed in the car so that an alert may be triggered if someone loses consciousness. If a motorist is found to be under the influence of alcohol while driving, the system will deliver an audible warning and halt the car. Also, the door will be opened for us automatically.

STEERING WHEEL MOVEMENT[13] SWM is a frequently used vehicle-based measure for assessing the extent of driver sleepiness. It is assessed using a steering angle sensor. Angular sensors on the steering column are used to monitor the driver's steering behaviour. Drowsy driving results in fewer microcorrections made to the steering wheel than awake driving. According to Fairclough and Graham, sleep-deprived drivers reversed their steering wheels less often [13]. The researchers only investigated modest steering wheel motions (between 0.5° and 5°) required to modify the lateral position inside the lane in order to exclude the influence of lane changes [12]. As a result, using modest SWMs, it is feasible to identify the driver's sleepiness status.
if necessary, notify the driver of a sleepy state. For testing purposes, light sidewinds were applied to the curves of an actual road in order to have drivers do corrective SWMs. Many car makers including as Nissan, BMW, Volvo, Renault and others have implemented SWMs but it only works in a very narrow range of circumstances. This is due to the fact that they only work consistently in certain conditions and are considerably more reliant on the geometric qualities of the road than the kinetic properties of the vehicle.

LANE POSITION DEVIATION AS A GENERAL TREND (SDLP) Another way to gauge a driver's tiredness is to use the SDLP [14]. Simulated environments use software to calculate the SDLP, whereas field trials make use of an external camera to determine the lane's location. As KSS ratings grew, so did SDLP (metres), according to an experiment done by Ingre et al. [14] to obtain numerical statistics from SDLP. Ratings 1, 5, 8, and 9 on the KSS scale, for instance, mean

Figures for the SDLP ranged from 19 to 46.47. There were 20 participants, and their SDLP was averaged together.however, with some drivers, the SDLP did not exceeded 0.25 m even for a KSS rating of 9. In the above experiment by performing correlation analysis on a subject to subject basis significant difference is noted. Another limitation of SDLP is that it is purely dependent on external factors like road marking, climatic and lighting conditions. In summary, many studies have determined that vehicle-based measures are a poor predictor of performance error risk due to drowsiness. Moreover, vehicular-based metrics are not specific to drowsiness. SDLP can also be caused by any type of impaired driving, including driving under the influence of alcohol or other drugs, especially depressants

CONCLUSIONS

Existing methods include image processing, EEG, vehicle, and verbal metrics among others. There is no guarantee that any of these methods will provide 100% success. EEG-based techniques are the most effective, but they are also the most obtrusive. Other approaches have restrictions that prevent them from yielding flawless results. As a consequence of our research, we've come to the conclusion that combining two or more ways may assist alleviate the drawbacks of each strategy while still allowing us to get the greatest possible outcome. This might take us in the right direction.

in the development of a driver fatigue detection system that is both non-intrusive and very effective. There are a number of ways in which we may integrate image processing techniques with vehicle and physiological parameters. Physiological parameters such as heart rate and breathing rate may be effective indications of tiredness. Wireless sensors that can be attached to seat belts, seat coverings, etc. may be used to reduce the intrusiveness of physiological assessments.

REFERENCES

[1] Marco Using visual information, a real-time warning system for driver drowsiness has been developed by Javier Flores, José Mara Armingol, and Arturo de la Escalera. Published by Springer Science + Business Media B.V. in 2009

In addition to [2] Luis M. Bercasa, [3] Jose Nuevo [4] and Miguel

Real-time system for monitoring driver vigilance: A. Sotelo, RafaelBarea, and Mara Elena Lopez. An article published in the March 2006 issue of the journal ieee transactions on intelligent transportation systems

Mohamad-Hoseyn Sigari, Mahmood Fathy, and Mohsen Soryani: A Driver Face Monitoring System for Fatigue and Distraction Detection. In the city of Hindawi, Pakistan

Journal of Vehicle Technology, Published by Publishing Corporation, Volume 2013,

Number 263983, a total of 11 pages

A Survey on Driver Drowsiness Detection Techniques," given at IJRITCC in November 2013 by Jay Fuletra and Bulari Bosamia.Jin-Fu Yang, Ming-ai Li, and Cheng Zhang are the authors of this article.

It is possible to detect drowsy driving by using an EEG method. FSKD 2010: 7th International Conference on Fuzzy Systems and Knowledge Discovery, 5, pp. 2164-2167, 10-12 August 2010. Artificial Neural Networks may be used to detect and protect drivers who are drowsy. [6] Er. Manoram Vats and Er. Anil Garg. According to Applied Science and Technology Advances: An International Journal Pages 39-43 in Vol. 1, No. 1, January-June 2012

In this paper, we provide a method for detecting driver drowsiness based on the detection of yawns. In: The University of Ottawa's Virtual Environments Research Laboratory

Canada's capital city of Ottawa

Vision-based Real-time Driver Fatigue Detection System for Efficient Vehicle Control, by D.Jayanthi and M.Bommy: In:

International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249

– 8958, Volume-2, Issue-1, October 2012

[1] Sommer, D.; Golz, M.; Trutschel, U.; Edwards, D. Biosignal based discrimination

between slight and strong driver hypovigilance by support-vector machines. In Agents and Artificial Intelligence; Springer: Berlin, Germany, 2010; Volume 67, pp. 177– 187.
[2] Ingre, M.; ÅKerstedt, T.; Peters, B.; Anund, A.; Kecklund, G. Subjective sleepiness, simulated driving performance and blink duration: Examining individual differences. J. Sleep Res. 2006, 15, 47–53.
[3] Hu, S.; Zheng, G. Driver drowsiness detection with eyelid related parameters by support vector machine. Exp. Syst. Appl. 2009, 36, 7651–7658.
[4] Otmani, S.; Pebayle, T.; Roge, J.;Muzet, A. Effect of driving duration and partial sleep deprivation on subsequent alertness and performance of car drivers. Physiol. Behav. 2005, 84, 715–724.
[5] Fairclough, S.H.; Graham, R. Impairment of driving performance caused by sleep deprivation or alcohol: A comparative study. J. Hum. Factors Ergon. 1999, 41, 118–128.
[6] Ingre, M.; ÅKerstedt, T.; Peters, B.; Anund, A.; Kecklund, G. Subjective sleepiness, simulated driving performance and blink duration: Examining individual differences. J. Sleep Res. 2006, 15, 47–53.
[7] Simons, R.; Martens, M.; Ramaekers, J.; Krul, A.; Klöpping-Ketelaars, I.; Skopp,
G. Effects of dexamphetamine with and without alcohol on simulated driving. Psychopharmacology 2012, 222, 391–399.