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Analysis of Drowsiness Detection System

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Abstract- Most of the road motor accident happen due to the driver drowsiness on highways. Safety is most important during travelling or driving. A single mistake of driver can lead to a majoraccident.Therearemanydevicesandsensorsareavailable inthemarkettomakedriverworkeasy.Inthiseraoftechnology, we need to develop a system which can detect the drowsiness of the driver and alert the driver. For detection of drowsiness of the driverwecansimplyobservetheconditioneyesofthedriver.This could save number ofaccidents.

Keywords-Drowsiness,accident,computervision,Facedetection, eyedetection.

I. INTRODUCTION

Accordingtotheresearches somehowdrowsinessisrelatedtolakhsof accidents every year in world, as the driver fallen asleep the impact is at high speed which causes death or serious injuries. [3] According to the results of the study presented at theInternationalSymposiumonSleepDisordersofdriveris responsible for almost 30% of the road accidents. As sleepingisthebasicneedofahumanbody,whichmakesthe driver less attentive or lazy. That's why we need to develop a system which will detect the physical condition of the driver and notify him. The development if technology introduces more advanced solution in everyday life. Computer vision or vision based systems are widely being used different industries like transportation, for security purposeetc.Differenttechniquescanbeusedfordrowsiness detectionofthedriverlikeneuralnetworkbasedtechniques, image processing based vehicular based techniques etc. we canalsousethesmartphonesofthedriverstonotifythemas it becomes almost the basic need of the human being. [2] Generally, in detection of the drowsiness of the driver the techniques used are monitoring eye blinking, recognizing the yawning of the driver vehicular based techniques. Most of the researchers use the eye blinking and yawning detection to recognize the drowsiness of thedriver.

II. DROWSINESS

Drowsiness is refers to felling abnormally sleepy during the day, they fall asleep in inappropriate situation at inappropriate times. Drowsiness can be happen due to different reasons like-

- Having to work long hours or in differentshifts
- Sleepdisorders
- Medical conditions like Diabetes, thyroidetc.
- Medicines

Due to the drowsiness of the driver most of the accidents happen on highways or on the roads.

III. DIFFERENT METHODS USED FORDROWSINESS DETECTION

A. Steering Patternmonitoring

It is totally based on the steering wheel movement,breaks and acceleration. A device or sensor which will monitor these things to detect the drowsiness ofthe

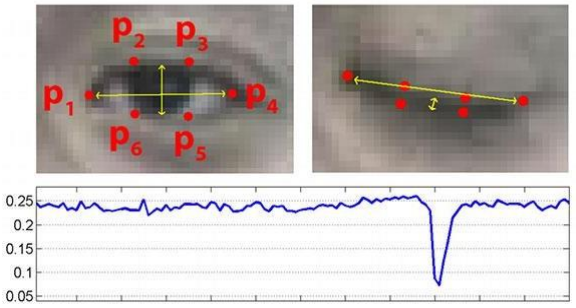

fig. 1-Eye blink detection

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system. The sensor will analyze the performance of

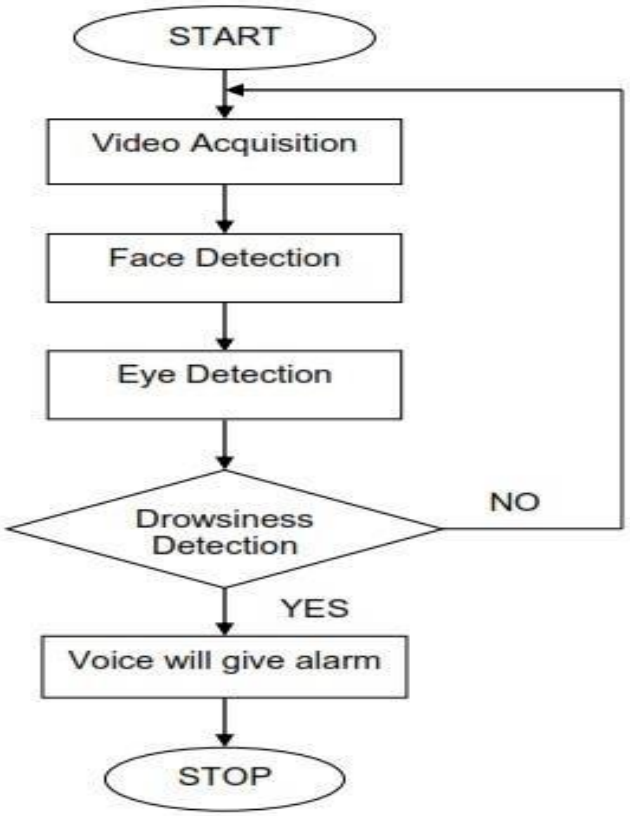

Fig 2-flow of the system

vehicleandperformanceofthedriveronthelane.Nowadays mostthecarshavedriverassistantwhichwillmonitoringthe irregular behavior on the lanes . Sensor also detect the pressure on the steering wheel put by driver, if it increaseto the certain level it will again start the alarm. And alert the driver by starting the alarm, actually it is indirect way of monitoring the drowsiness of thedriver.

B. Eyes analysis and facial Expression Recognition

In this technique if driver closes eyes for certain period of timethensystemwillgenerateaalarm,thismethodissimple and easy to implement because it has developed model for the states of the eyes.[7] Researchers have used this technique to detect the drowsiness the driver.

Fig 3-Facial expression detection

Yawning is the common symptom of drowsiness of the being,whichisalsomodelledbyusingartificialintelligence neuralnetworkbyusingdifferentpicstakenduringyawning i.e. open mouth pics, these models are trained at thousands orlakhsofpicstoachievethehighaccuracy.Whenyawnof the driver is detected then the system will alarm the driver. Some researchers combine both of these techniques to achieve the higher accuracy.

C. Physiologicalmeasurement

In this technique drowsiness system requires more than one device or sensor to detect the physical condition of the driver.[5] Sensors will analyze the various parameters of the bodylikementalactivity,heartrate,skinconductance,muscle activity depending on these parameters system will decide the condition of the driver. A decrease in heart rate or increaseinheartrate,sizeofthepupil,thesevariableshasto be the indicator of the drowsiness and inform the driver by alarmorbyusinganotherwayslikesmartphoneapplication.

D. Neural Network Based

Using neural network we not only detect the drowsiness of the driver but we can also predict the drowsiness of the driver.[2] As we can use the machine learning algorithms to recognise or detect the eyes of the driver. And neural networkneuronsforthepredictionofthedrowsiness.Based on the model which is trained using the picture of the thousands of the people feeling drowsy during driving the vehicle using more than one neurons to get the high accuracy.

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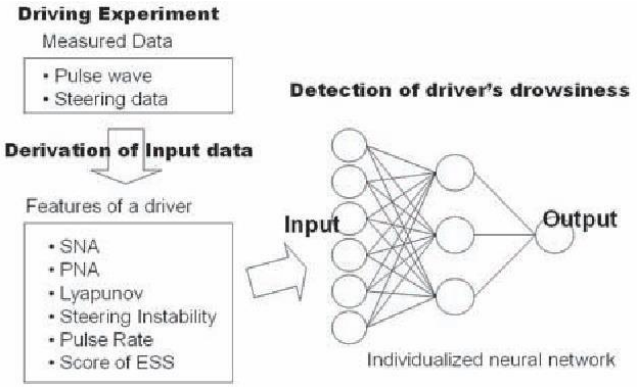

Fig.4-neural network flow for drowsiness detection

IV. Conclusion

Afterthoroughanalysis,wegetthatthesystems we are usinghave various approaches like image processing, vehicular approach, Neural network-based recognition etc. none of them gives 100% results. In order to reduce the number of road accidents due to driver drowsiness we need to develop a system that would detect the drowsiness of the driver by analysing the real time face of the driver during driving the vehicle. But the neural network based system is the most effective with the help of other methods we can get the higher accuracy. Thus, on the basis of our study we can say that a combination of more than one approaches we can achieve better result by reducing the drawbacks of the other approaches.

REFERENCES

[1] Prakash choudahry, Rahul Sharma, Gautam Singh,SmarjeetDas"A survey paper on drowsiness detection& Alarm systemdrivers" ,2017.

[2] Wanghua, Ruoxuewu "Real time driver drowsiness detection system using facial features, IEEE,2019

[3] Marco Javier Flores José María Armingol Arturo de la Escalera.: Real-Time Warning System for Driver Drowsiness Using Visual Information. In: Springer Science + Business Media B.V.2009.

[4] Skoda brand fatique detection system{Available– 2017.06.01: http://www.sklep.skoda.pl/upload/files/Fabia_3_akcesoria_2015-01.pd

[5] World Health Organization. Road Safety: Basic Facts.; 2016.

[6] Jay D. Fuletra, BulariBosamia: A Survey On Driver's Drowsiness Detection Techniques presented at IJRITCC in November2013.

[7] Grace R, Byrne VE, Bierman DM, Legrand JM, Gricourt D, Davis BK, Staszewski JJ, Carnahan B.: A drowsy driver detection system for heavy vehicles. In Digital Avionics Systems Conference, 1998. Proceedings., 17th DASC. The AIAA/IEEE/SAE 1998 Nov (Vol. 2, pp. I36-1).IEEE.

[8] Chang K, Oh BH, Hong KS. An implementation of smartphone-based driver assistance system using front andrearcamera.InConsumerElectronics(ICCE),2014 IEEE International Conference (pp. 280-281). IEEE (2014)

[9] Informationaboutthevideofatiquedetectionsystem {Available – 2017.06.01:}

[10] Singh H, Bhatia JS, Kaur J.: Eye tracking based driver fatigue monitoring and warning system. InPower Electronics (IICPE), 2010 India International Conference. pp. 1-6. IEEE(2011)

