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Driver Drowsiness Detection System using Machine Learning

Charan M[1], Deepak R[2], Dhrushtitha[3], Bugude Manjunatha[4], Prof. Lithin K[5]
[1, 2, 3, 4]*School of Computing and Information Technology, Reva University.*
[5]*Guided*

Abstract: ***We propose a Driver drowsiness detection system, the purposes of which are to prevent from dangerous cause and to avoid accidents. Since all the processes on image recognition performed on a smart phone, the system does not need to send images to a server and runs on an android smart phone in a real-time way. Automatic image-based recognition is a particularly challenging task. Traditional image analysis approaches have achieved low classification accuracy in the past, whereas deep learning approaches without human supervision real-time drowsiness detection. This model classifies whether the person's eyes are opened or closed. To recognize the face, a user should have to adjust camera such a way that it covers his face first, and then the system starts recognition within the indicated bounding boxes. In addition, the system estimates the actions of the person. This recognition process is performed repeatedly about every second. We will implement this system as Web application effectively for real-time recognition.***

I. INTRODUCTION

Road accidents have become one of the major factors for the loss of lives or any dangerous cause for lives. One of the causes for the accidents is due to the drowsiness of the driver so the human factor plays a major role in the accidents. The reason for fatigue is insomnia or sleeplessness. In general the driver fatigue alone accounts around 20 percent of the road accidents are fatigue related. It was confirmed by a study conducted by AAA foundation for Traffic safety.

In the recent years, the several algorithms in vehicles has developed considerably. The development of this technology is both an industry and academic challenge. In the automobile industry, Volvo developed an alarm system which suspects driver drowsiness by using its lane departure warning system through a vehicle-mounted camera. Following the similar idea Mercedes-Benz introduced an Attention Assist system that collects data from driving patterns if the date obtained is uncertain(like eg: gradual increase in speed, uneven steering circumstance).

Although, the safety measures to prevent road accidents using driver drowsiness detection technology are not widespread and are usually found in luxury cars. However from the survey an increased embedding and connecting of smart devices equipped with sensors like Android can be used to implement this technology. In addition machine learning has evolved and made groundbreaking advances especially in the area of deep learning. Thus, these methodologies can be effective way to increase the efficiencies of the existing real-time driver drowsiness detection system and to provide a tool that can be widely used by drivers.

II. LITERATURE SURVEY

1) In this paper, they proposed a technique to identify driver's eyes conclusion and yawning for drowsiness investigation by IR camera. This technique comprises of four stages, specifically, face location, eye discovery, mouth identification, and eyes conclusion and yawning recognition. The exactness pace of eyes conclusion location, and yawning discovery were 98%, and 92.5%, respectively. This technique can identify eye conclusion and yawning in low light condition. Weakness: Mistakes happened when face is covered with hand or different objects.

2) Drivers Drowsiness Detection in Embedded System. In the Technical Paper they used "HAAR CASCADE" to detect face and . Haar Cascade is a machine learning object detection algorithm used to detect objects in an image or video. They have also used CAMShift algorithm i.e., The CAMShift (Continuously Adaptive Mean Shift) algorithm is a colour-based object tracking method to reduce computational complexity of the methods used during that period. It applies meanshift first. Once meanshift meets, it refreshes the size of the window as, $s=2\times\sqrt{M00/256}$. It additionally computes the direction of the best fitting circle to it. Again it applies the meanshift with new scaled inquiry window and past window area. The cycle proceeds until the necessary exactness is met.

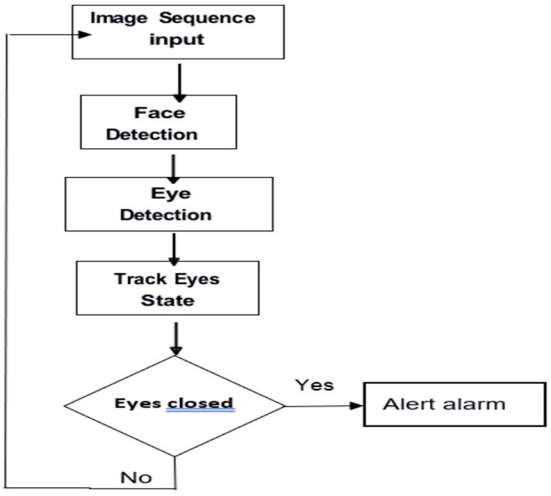
3) Implementation of Detection System for Drowsy Driving Prevention Using Image Recognition and IoT. [1]Seok-Woo Jang and [2]Byeongtae Ahn. In this paper, machine learning was applied to predict drowsiness and improve drowsiness prediction using facial recognition technology and eye-blink recognition technology. Furthermore, a CO2 sensor chip was utilized to recognize extra drowsiness. Speech recognition technology was also used to apply Speech to Text (STT), allowing a driver to request their desired music or make a call to avoid drowsiness while driving. Hence, the framework proposed in this paper improves the performance of the tiredness avoidance system by expanding the precision and decreasing the mistake pace of sleepiness recognition by combining a few strategies for the current items used to distinguish and forestall drowsy driving.

III. PROPOSED SYSTEM

The existing model has a recognition system which recognizes the drowsiness of the person. The model which we are going to propose will recognize drowsiness and actions of the person (like eg: using webapp . In our proposed system for activity recognition of the person driving the vehicle, and giving alert based on the obtained result as a first step toward the improvement of a portable application.

IV. METHODOLOGY

1) *Data Collection:* Take picture as input from the camera
2) *Data Cleaning:* To identify and remove errors & duplicate data by creating a region of interest, in order to create a reliable dataset. This improves the quality of the training data for analytics and enables accurate decision-making.
3) *Detect:* Detection of eyes from region of interest and pass it to classifier.
4) *Classification:* Classifier will categorize whether eyes are opened or closed.
5) *Result:* Calculate the score to check whether the person is drowsy. The score is calculated by examining how long the person has closed his eyes.



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V. EXPECTED OUTCOME AND RESULT

After completion of this project, a web app is created where a box is displayed on the phone screen. So it scans by pointing the lens towards the person. Then the application will recognize the face and eyes, after which it will identify the state of eyes and give alarm if the eyes are closed.

VI. CONCLUSION

The accidents are growing rapidly and the accurate detection is very much required more than ever, we propose to solve these problems and provide user with the output which will make user alert

VII. ACKNOWLEDGMENT

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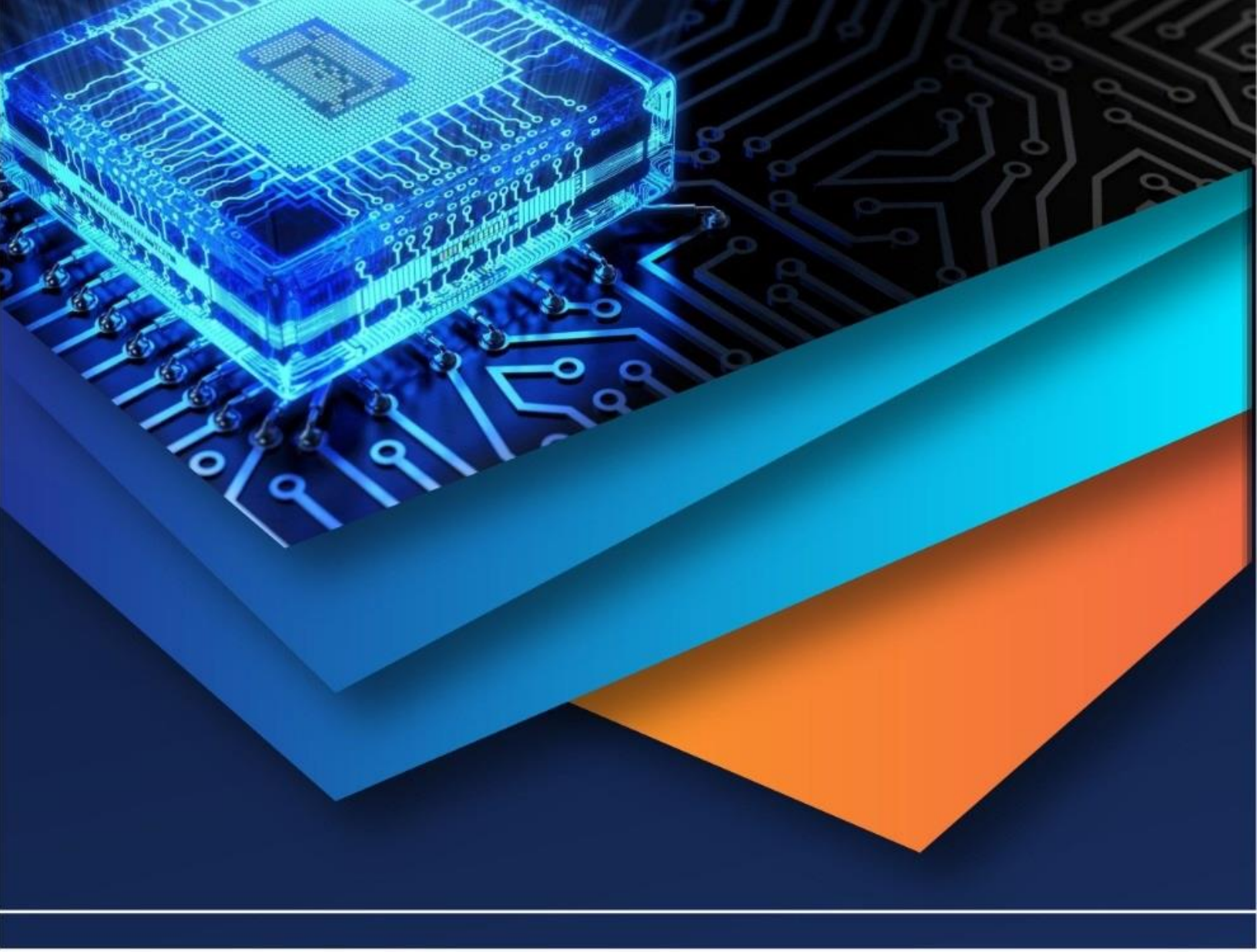

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