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VEHICLE SECURITY BY HUMAN EYE BLINK

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ABSTRACT:

This project developed a prototype integrated system that combines machine vision-based drowsy driver monitoring technology and accident prevention system analysis of operator/vehicle performance to reliably assess driver drowsiness. Drowsiness and Fatigue of drivers are amongst the significant causes of road accidents. They increase the amounts of deaths and fatalities injuries globally. In this project, a module for Advanced Driver Assistance System is presented to reduce the number of accidents due to driver's fatigue and hence increase the transportation safety. The purpose of this system will be reliably quantifying commercial motor vehicle driver drowsiness and provide a real-time warning to the driver and/or a control output to the commercial steering or other systems as warranted.

KEYWORDS:

INTERNET OF THINGS(IOT), DROWSINESS DETECTION, ADAS, DMS, MOBILITY DEVICE.

INTRODUCTION

Most of the road accidents are caused because of drowsiness and drunk driving and also working environments, reduced sleep and time factor. Driver drowsiness and fatigue drunk driving reduces the driver decision making capability and perception level. These two situations affect the ability to control the vehicle. There are some techniques which are used to detect drowsiness in drivers like by sensing of driver operation or physiological characteristics of driver like or vehicle movement etc. Advanced Driver Assistance Systems (ADAS) are aimed to simplify and aid the driver in monitoring, warning, braking, and steering tasks through havariety of assisting technologies. Primary goal of these systems is to provide safety for a driver and help to prevent road accidents. ADAS systems are undeniably one of the fastest growing areas in the automotive industry. When designed with a safe human-machine interface, they offer increased car and road safety by offering technologies that alert the driver to potential problems, helping to avoid collisions and accidents. An image processor does the functions of image acquisition, storage, preprocessing, segmentation, representation, recognition and interpretation and finally display so records the resulting image. The following block diagram gives the fundamental sequence involved in an image processing system. In order to classify a set of data into different classes or categories, the relationship between the data and the classes into which they are classified must be well understood. To achieve this by computer, the computer must be trained. Training is key to the success of classification techniques were originally developed. Statistics is the study of the collection, organization, analysis, and interpretation of data. It deals with all aspects of this, including the planning of data collection in terms of the design of surveys and experiments. The internet of things connects billions of devices to the internet and involves the use of billions of data points, all of which need to be secured. Due to its expanded attack surface, IoT security and IoT privacy are cited as major concerns. Because IoT devices are closely connected, all a hacker has to do is exploit one vulnerability to manipulate all the data, rendering it unusable. And manufacturers that don't update their devices regularly or at all leave them vulnerable to cybercriminals.

MATERIALS AND METHODS:

Anin put from a color video camera attached in front of the driver and processes the grabbed frames for the drowsiness detection. The detector system is composed of a video camera and software that regularly checks the eye of the driver to detect the eye blink duration. We start with the detection of the face using the Viola Jones face detector available in the Open CV library. Then, we used the neural network-based eye detector available in the STASM library to locate the positions of the pupils. The STASM is a

variation of the Active Shape Model of Coote's implementation. We derived only the Rowley's eye detection code for real-time speed constraints from the STASM library which is a group of neural networks that provides eye positions. After the eye detection, we estimate the orientation of the face using the vertical positions of both eyes. If they are not in the same position, we compute the angle between these two pupil points. Then, we correct the orientation of the face by rotating the whole frame in the opposite direction. The origin of the rotation is the face center. In this way, we eliminate the left and right rolling effect of the face upto±25degree.

Finally, we extract a rectangular area from the pupil area of the eye. The width and height of the region of interest are respectively set to 0.5 and 0.16 of Inter Pupillary Distance (IPD) and resized to 20×15 for normalization. In case of missing eye detection, we used the previous eye positions with respect to the detected face which provides the absolute position of the eyes. If only one eye is missing, then the position is computed considering both the current dx and dy difference of the detected eye with respect to its location in the previous frame. After that, displacement values the dx and dy values are added to the previous location of missed eye location. In this eye blink in grate and eye closure duration is measured to detect driver's drowsiness. Because when driver felt sleepy at that time his/her eye blinking and gaze between eye lids are different from normal situations so they easily detect drowsiness. In this system the position of irises and eye states are monitored through time to estimate eye blinking frequency and eye close duration. And in this type of system uses are motel placed camera to acquire video and computer vision methods are then applied to sequentially localize face, eyes and eye lids positions to measure ratio of closure. Using these eyes closer and blinking ration one can detect drowsiness of driver. The driver drives in a cruising speed and in sudden curve is unable to control the vehicle leading to accident. All the sensed details displayed with LCD display and updated to IoT.

MATERIALS:

HARDWARE:

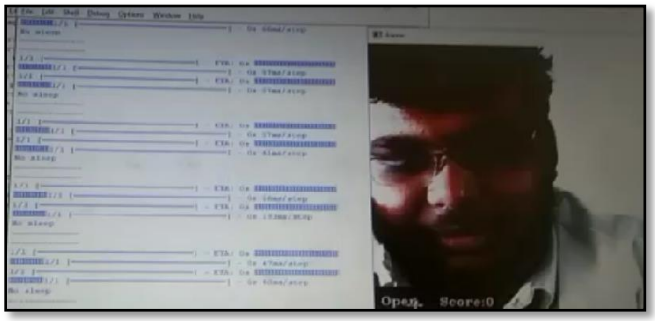
- Power Supply Unit
- Arduino UNO
- Vibration Motor
- Relay
- Water Motor
- LCD Display Unit
- Node MCU
- Buzzer

SOFTWARE:

- Python IDLE

RESULTS:

The drowsiness detection and correction system develop discapable of detecting drowsiness in a rapid manner. The system which can differentiate normal eye blink and drowsiness which can prevent the driver from entering the state of sleep in ess while driving. The system works well even in case of drivers wearing spectacles and under low light conditions also. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for about two seconds, the alarm beeps to alert the driver and the speed of the vehicle is reduced. By doing this many accidents will reduce and provides safe life to the driver and vehicle safety. A system for driver safety and car security is presented only in the luxurious costly cars. Using drowsiness detection system, driver safety can be implemented in normal cars also.



Above mentioned figure shows the result of the drowsiness status. It shows the drivers an eye is open. So, the result is driver is not in drowsiness.

Above mentioned figure shows the result of the drowsiness status. It shows the drivers an eye is closed. So, the result is driver is in drowsiness state.

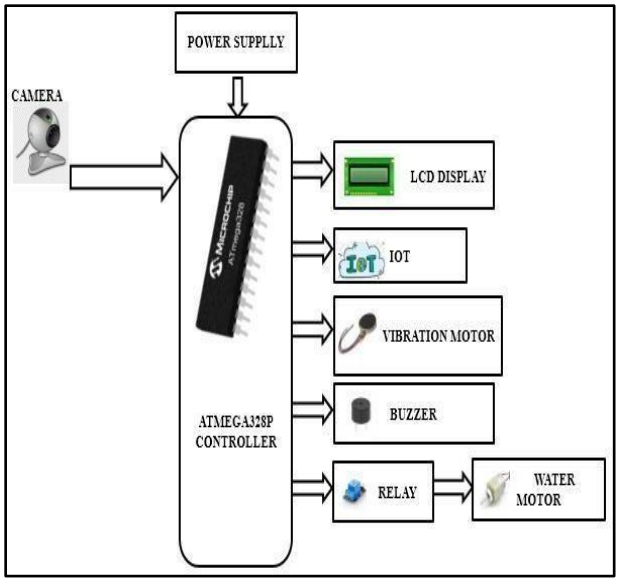
DISCUSSION:

According to the report 2020 based on the road accidents in India presented by Ministry of Road Transport & Highway, disclose that 4,77,044 accidents took place in states as well as in Union Territories. The proposed method predicts Drowsiness based on machine learning and cascade objection detection. This proposed deep learning model trains different features of a driver from the data set which comprises images of driver in different states to detect the drowsiness and non-drowsiness state. we intend to focus on yawning analysis is for fatigue detection by landmark points of mouth that leads to more accurate system as decision-making unit. We also focus on the creation of a suitable dataset that covers a wide range

of different races for making more reliable drowsiness comparison.

FIGURES:

HARDWARE BLOCK DIAGRAM:



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