

Car Key Access using Face Detection and Driver Drowsiness

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Abstract - In recent years, one of the leading causes of car accidents around the world has been driver weariness. The measurement of the state of the driving power, i.e., drowsiness, is an immediate technique to evaluating driver weariness. As a result, it's critical to pay attention to the temporary state of the driving force in order to prevent squandering life and property. The goal of this research is to create a temporary state detecting system paradigm. This technique could be a real-time system that continuously takes images and measures the state of attention in accordance with the intended rule, as well as providing warning if necessary. Though there are various ways for waking up from somnolence, this strategy is completely non-intrusive and has no influence on the motive force in any way, therefore revealing the precise state of the motive force. The per closure worth of an eye is taken into account while detecting somnolence. When the amount of eye closing surpasses a certain threshold, the motive force is said to be sleepy-eyed. Many OpenCV libraries, as well as Haar-cascade, are utilized to implement this technique. Also, so as to enhance the protection and safety of the driving force and additionally strictly monitor if the driving force is following "do not drink and drive" rule. The alcohol is been detected before the vehicle is begin if at the driving force consumption of alcohol is detected by the driving force the vehicle won't start. This eliminates the desire to breach the foundations while being safe at the same time.

Keywords:- Component: Drowsiness Monitoring, face tracking, yawning detection.

I. INTRODUCTION

Due to insufficient sleep, extended periods of continuous driving, or other medical conditions such as brain problems, the driver's concentration level deteriorates. According to various studies on road accidents, weariness of the driving force is responsible for roughly thirty percent of all accidents. When a motorist drives for longer than is normal for a human, he or she suffers from excessive exhaustion, which leads to fatigue, which causes the driver to go into a sleepy-eyed state of consciousness. Somnolence is a stage of development in which the driving force's alertness and acute awareness levels are reduced. Although there is no direct technique to observe somnolence, several indirect methods will be employed.

To sight alcohol consumption by driver, if the alcohol level detected is on top of threshold the engine won't begin and it'll alert that the alcohol consumption is high and this project consists of auto safety.

In the vehicle it has a tendency to put in Gas sensing element and GPS module. once the hearth had occurred to the automotive then the latitude and therefore the great circle of

the place are going to be sent to the near extinguisher station with the assistance of GPS module. the hearth extinguishers can come back delay the hearth and save then person from the hearth.

II. PROBLEM STATEMENT

Driver drowsiness has remained a major corporate and public-safety issue since the 1990s. Driver weariness was identified as the top priority cytomegalovirus safety concern at the 1995 FHWA-sponsored Truck and Bus Safety Summit, which was attended by over 200 national leaders in cytomegalovirus and road safety, as well as a large group of drivers. As a result, weariness is the primary focus of the present FHWA-sponsored human factors study on CMV driving safety.

Driver drowsiness could be a serious safety hazard in herpes transportation. Herpes drivers could work for up to ten hours after an obligatory eight-hour break under current federal hours-of-service (HOS) legislation in the United States. The longest driving time in Canada is thirteen hours. Several CMVs operate during the night, and drivers' schedules are frequently inconsistent and unexpected. The majority of their mileage is accumulated on long trips on interstate and limited-access highways. Due to CMVs' high annual mileage exposure (often 5-10 times that of passenger vehicles) and other factors, the risk of being involved in a fatigue-related crash is much higher for commercial drivers than for non-commercial drivers – despite the fact that herpes drivers make up a small percentage of all drivers involved in fatigue-related crashes. Moreover, several different crash risk variables, such as alcohol use, speeding, and other dangerous driving behaviours, are often less common in crashes involving commercial drivers. As a result, weariness is a greater problem for these herpes drivers and their automobiles. In addition, it detects automotive fire conditions by assessing vehicle position and using a location instrument to produce information about the spot where a fire has happened. Van needed human activity media by conveying that information to a health help an emergency service provider.

III. OBJECTIVES

The project is additionally been designed to be additional operating vision exploitation minimum hardware at the lower level of process. These systems are directed at specific applications. The objective is to style an automotive key access exploitation face detection and driver somnolence and hindrance system that might fulfill the following:

- Fatigue warning systems (FWS) are projected as specific counter measures to scale back the collisions related to driver fatigue
- These devices use a spread of techniques for police work driver temporary state whereas operative a vehicle and signal a driver once important temporary state levels area unit reached.
- However, the detection of driver fatigue mistreatment valid, unnoticeable, and objective measures remains a major challenge.
- Detection techniques could use lane departure, handwheel activity, ocular or facial characteristics.
- Together with this after all, Drivers have an obligation to not exceed speed limits, exceed most work limits or breach minimum rest needs.

IV. MOTIVATION

It is same that the worst explanation for death by automotive accident is drowsy driving. several studies are dedicated to discover drivers' somnolence from their behavior or biological signals like cardiogram and blood vessel pulse wave to forestall drowsy driving. However, there has been few analyses centered on the relation between drivers' head motion and their somnolence. during this study, it has a tendency to aimed to clarify the connection between head driver's motion and their somnolence. 2 acceleration sensors were equipped to subject's head and seat. Subjects were asked to drive an automotive underneath 2 conditions, i.e., in rousing state and drowsy state once over twenty hours sleep deprivation. The distinction between the acceleration of head and seat were calculated, and therefore the results show that head motion decreases in step with driver's somnolence.

Usability study is that it is utilized in every type of cars, the vehicles driven through out day and night. it's thought-about to be reliable unless there's no physical harm to the physical circuit. it's straightforward to take care of the instalment is only once and desires scrutiny once in one to 2 months. Financially it's reasonable once it involves the price of life a number of greenbacks, interference is best than cure.

V. LITERATURE SURVEY

A. Fatima Jabeen [1] The consider offers a start framework that identifies and cautions drivers in genuine time (2017), Purposed for programmed confront acknowledgment, liquor inebriation. the most important goal of this prompt system is to reduce the frequency of accidents caused by drowsy or sloshed drivers, improve transit safety, and safeguard vehicles from thieving.

C.Nandakumar, G. Muralidaran, and N. Tharani [2] "Real-Time Vehicle Security System using Face Recognition," International Review of Applied Engineering Research, Vol. 4, pp.371-378, 2004. The method conferred during this paper takes images of the driving force and compares them to inform to see whether or not he's a documented driver. The face detection system detects faces in cars exploitation and increased PCA technique. the opposite modules give users with crucial info and assist keep a watch on cars in the slightest degree times, even once they are missing. This Raspberry Pi-based system example

manages all of the procedures. Through a text message from his phone, the owner is ready to execute automobile halting. The GPS module within the automobile acknowledges the vehicle's position. As a result, the identification of the stealer and therefore the location of the car are merely wiser and fewer dear with this technique than with a customary one. Shruti V. Deshmukh [3] Car thefts and identity fraud have been a severe problem (April 2017), Purposed a biometric identification system should be designed to forestall these thefts and identity fraud. The goal of this project is to form a biometric identification primarily based intelligent security answer. Face detection is finished with Haar-like options, whereas face identification is finished victimization the HOG + SVM technique. It has a tendency to use the OpenCV libraries and therefore the Python programing language to enhance accuracy and efficaciousness. The coaching and authentication area unit dole out employing a Raspberry Pi primarily based embedded device.

Ketan J. Bhojane [4] The only method to power the automobile or supply ignition to the engine is with a vehicle key (may 2018), Purposed by subbing the key with a selected user's face, the facial recognition-based automobile ignition physically races the car ignition. once handling the topic, the goal is to form luxury characteristics whereas still worrying regarding safety, which can be accomplished through the utilization of car physics. during this analysis, It has a tendency to propose a face recognition system mistreatment the Raspberry Pi and MATLAB's face detection and face pursuit system algorithms.

Shejina V. and Asil A. [5] "Automotive Theft Detection Using Face Recognition," International Journal of Research Engineering and Technology, Vol. 5, No. 10, Oct. 2016, pp.2319-7308, It presents the employment of an automobile is turning into a basic demand for everybody. what is more, it's important to safeguard the automobile from thieving. ancient automobile security systems consider an outsized variety of sensors and area unit dear. once an automobile is taken, there could also be no alternative action or possibility out there to help the owner of the automobile in ill it. the key reason of this ponder is to utilize a quick, unrealistically simple, exact, reliable, and productive confront acknowledgment approach to guard the vehicle against undesirable passage.

G. J. AL-Anizy, M. J. Nordin, and M. M. Razooq [6] "Automatic Driver Drowsiness Detection Using Haar Algorithm and Support Vector Machine Techniques", Asian Journal of Applied, it's is purposed among the event that the trust is attempting ahead, fatigue identification is performed. If not, diversion discovery is performed. Besides, another eye recognition, calculation is given. It joins versatile boosting, versatile format coordinative, and blob revelation with eye acknowledgement. Those calculations diminish the eye discovery lapse and handling time primarily, by accomplished an equivalent calculation. Third, they have used principal half analysis (PCA), and linear discriminate analysis (LDA) with a specific end goal to appreciate precise eye identification. Fourth, they have planned a totally distinctive eye state detection calculation that joins appearances gimmicks got utilizing PCA and LDA, with measurable peculiarities. Harr cascade Classifier.

S. Salehian and B. Far [7] "Embedded Real-Time Blink Detection System for Driver Fatigue Monitoring", In this project presents, it any clarifies the strategy for utilizing the harr cascade tests and so therefore the separation of reflex and temporary state identification. This paper acquaints a vision primarily based strategy with characteristic the state. The numerous difficulties are face recognition, Iris location below fully completely different conditions and creating the \$64000 time system.

H. Singh, J. S. Bhatia, and J. Kaur,[8] "Eye tracking based driver fatigue monitoring and warning system", in Proc. IEEE IICPE, New Delhi, India, Jan. 2014, The first two methods are more accurate, but they are impractical since sensing electrodes must be attached to the driver's body, which is uncomfortable and distracting. The technique based on eye closure is highly suited for real-world driving conditions since it can be non-intrusive by using cameras to determine the open/closed state of the eyes.

E. Rogado, J.L. García, R. Barea, L.M. Bergasa,[9] Member IEEE and E. López, February 2013, "Driver Fatigue Detection System," Proceedings of the IEEE International Conference on Robotics and Biometrics, Bangkok, Thailand, February 2013. The processes that are based on human physiological phenomena are the most accurate in terms of accuracy.

Ann Williamson and Tim Chamberlain, [10] "Review of on-road driver fatigue monitoring devices", " NSW Injury Risk Management Research Centre, University of New South Wales, July 2013. Driver abnormality refers to a lack of attention to tasks that are required for safe driving in the absence of a competing activity. In the realm of ITS, the detection of in-vehicle driving behaviour is a hot topic. In the subject of driver anomaly monitoring and detection systems, several research have been undertaken using a range of approaches. Driver fatigue can be detected in a variety of ways, including physiological data, driver operation, vehicle response, and driver response.

Member IEEE, Boon-Giin Lee and Wan-Young Chung, [11] This approach can be used to assess brain waves (EEG), heart rate (ECG), and the open/closed status of the eyes, among other things, according to "Driver Alertness Monitoring Using Fusion of Facial Features and Bio-Signals," IEEE Sensors Journal, VOL. 12, NO. 7, July 2012.

VI. BLOCK DIAGRAM

The connection of components which is used for car key access using face detection and driver drowsiness has been shown below:

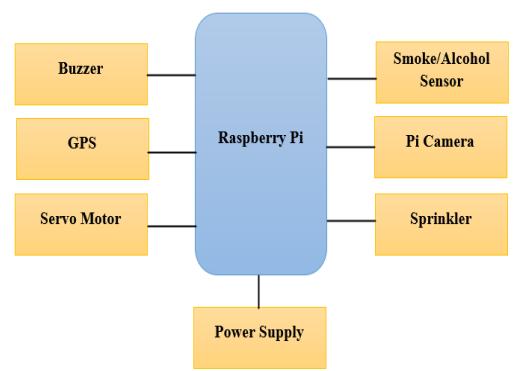


Fig 1: Block diagram

The main part of project is Raspberry pi or in other words, it is the heart of the project. Let's begin with the connection of the requirements i.e., Alcohol/Smoke sensor, buzzer, sprinkler, pi camera, a servo motor is connected. Alcohol sensor is used to detect the level of alcohol drunk by the people. If it crosses the threshold value it will turn off the ignition of the system. Smoke sensor used for detecting the level of smoke if it crosses the threshold value it sends the alert signal with the help of buzzer for the driver. Using pi camera when the face is recognized if it matches with the data base then automatically car door will open with the help of servo motor and then the car can be started. The face which is recognized if it does not match with the data which have been registered then the car door will not open. In this strategy eye is the choice parameter for finding the state of the driver. Then comes to driver drowsiness. The same pi camera will be tilted towards the driver then it will detect drowsiness of the driver. If the driver feels like sleepy the buzzer will produce the alert beep sound. If the driver does not get alerted then the sprinkler is used to sprinkle the water on the driver face. If the driver is not alerted then the car will stop. GPS is also connected to the raspberry pi. It is used to send the location of the car to the registered E-mail Id.

VII IMPLEMENTATION

Here connection or implementation of the project as shown below:

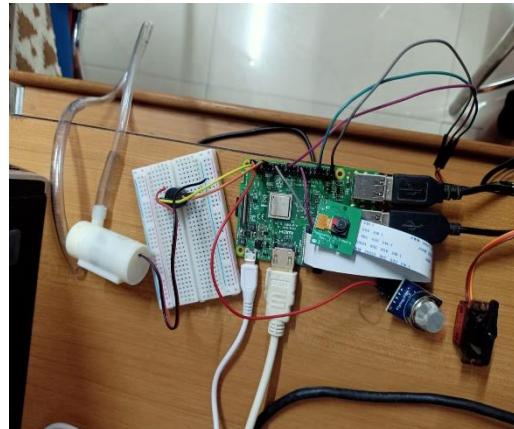


Fig 2: Implementation

The main part of the project is raspberry pi to that connect all the components needed for project. First comes the pi camera that connect is to the raspberry pi and with help of that it can recognise the face as well as for the driver drowsiness. After detecting the face servo motor is used to open the door. Then connect the MQ3 sensor to raspberry pi which is used for the detection of smoke and alcohol. The buzzer is also connected to the raspberry pi which is used to alert the driver that the fire has been occurred. For driver drowsiness the same pi camera will be used. The sprinkler is connected to the raspberry pi it sprinkles the water when the driver feels drowsy.

VIII. RESULTS

Here the results of the project have been shown below:



Fig 3: Results of Face detection

When the face is recognised, if that recognised face matches with the data base then the car door will open. If not recognised with the data which have been registered then car door remains closed.

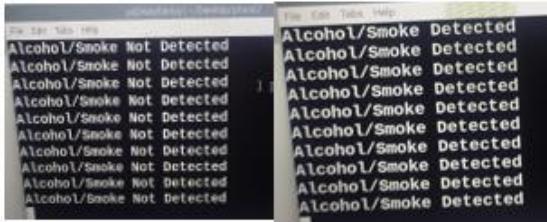


Fig 4: Results of Alcohol /Smoke Detection

After, the face recognition the person enters into the car. Then the sensor will detect whether the driver has been drunken or not. If the person is been drunken then the car will not start. If not detected then the car will be in on state. If the smoke has been detected then it alerts the driver with the help of the buzzer. If not, then the buzzer will be off. It will be continuously monitoring the alcohol and smoke level.



Fig 5: Results of Drowsiness

The monitoring of drowsiness will be activated continuously until the car stops. If it detects that the driver feels sleepy, firstly the buzzer system is used to alert the driver. Even after the warning of the buzzer the person feels drowsy then the sprinkler will sprinkle water on the face of the driver. Still the driver will be not alerted then the car will stop and the location of the car is sent to the registered E-mail Id with the help of GPS.

IX. CONCLUSION

The following steps were taken in order to carry out the sleepiness discovery with the Raspberry Pi: Effective location of liquor level and fruitful runtime filming of video with camera.

The captured footage was separated into frames, with each frame being examined separately. Face recognition was successful. If the driver's eye is closed for progressive outlines, it is categorised as a lazy condition; otherwise, it is considered an ordinary squint, and the circle of photographing and dissecting the driver's condition is repeated. In this case, when in a sluggish state. The car

ignition is started if the driver is not drowsy and the alcohol level is less than.

X. FUTURE ENHANCEMENT

Rather than using a Raspberry Pi, which isn't fast enough for video processing, you may use your own phone as the hardware. This can be accomplished by creating a proper mobile application that will do the same functions as the Raspberry Pi while providing a faster and more effective response.

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