International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 05 | May - 2022 Impact Factor: 7.185 ISSN: 2582-3930

INTELLIGENT SYSTEM OF DRIVER'S DROWSINESS

Nikita Girase, Anushka Dusane, Prajakta Mahakale, Manasi Pawar, Prof. Madhuri Malode

B. E Student, Department of Computer, Maratha Vidya Prasarak Samaj's Karmaveer Baburao Ganpatrao Thakare College of Engineering, Nashik, India
B. E Student, Department of Computer, Maratha Vidya Prasarak Samaj's Karmaveer Baburao Ganpatrao Thakare College of Engineering, Nashik, India
B. E Student, Department of Computer, Maratha Vidya Prasarak Samaj's Karmaveer Baburao Ganpatrao Thakare College of Engineering, Nashik, India
B. E Student, Department of Computer, Maratha Vidya Prasarak Samaj's Karmaveer Baburao Ganpatrao Thakare College of Engineering, Nashik, India
Department of Computer, Maratha Vidya Prasarak Samaj's Karmaveer Baburao Ganpatrao Thakare College of Engineering, Nashik, India

Computer Engineering Department, NDMVPS's KBTCOE, Nashik

ABSTRACT

The face, an important part of the body, conveys a lot of information. When a driver is in a state of fatigue, the facial expressions, e.g., the frequency of blinking, are different from those in the normal state. In this system, we propose a system called DriCare, which detects the drivers' fatigue status, such as blinking, and duration of eye closure, using video images, without equipping their bodies with devices. Owing to the shortcomings of previous algorithms, we introduce a new face-tracking algorithm to improve the tracking accuracy. Further, we designed a new detection method for facial regions based on 68 key points. Then we use these facial regions to evaluate the drivers' state. By combining the features of the eyes and mouth, DriCare can alert the driver using a fatigue warning.

Keywords: Face Detection, Firebase, Face API, GPS Tracking

I. INTRODUCTION

Real time images from drowsy driver dataset to process and predict driver behavior, and if drowsiness is sensed, the system alerts the driver. In the image processing approach, various techniques like segmentation, edge detection, computer vision, and similarity differential models to distinguish between driver's state and drowsy detection results. This approach despite the success gives high rate of false alarm, especially when the driver blinks continuously within intervals. In this system, we propose an objective non-contact-based method called DriveCare to detect the level of the driver's drowsiness.

The collected data are used to evaluate the driver's level of fatigue. Furthermore, objective detection is categorized into two: contact and non-contact. Compared with the contact method, non-contact is cheaper and more convenient because the system that does not require Computer Vision technology or sophisticate camera allow the use of the device in more cars. Owing to easy installation and low cost, the non-contact method has been widely used for fatigue-driving detection. For instance, Attention Technologies and Smart Eye employ the movement of the driver's eyes and position of the driver's head to determine the level of their fatigue. In this study, we propose a non-contact method called DriCare to detect the level of the driver's fatigue. Our method employs the use of only the vehicle-mounted camera, making it unnecessary for the driver to carry any on/in-body devices. Our design uses each frame image to analyze and detect the driver's state.

II. MODELING AND ANALYSIS

1.Detecting the driver drowsiness using android App.
2.Eye blinking rate calculated to detect drowsy.
3.Using GPS owner can track the vehicle.
4.Using mobile accelerometer detect an accident and send SMS to owner.

Architecture

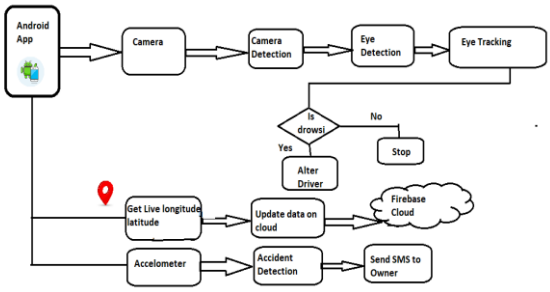


Figure 1: Flowchart

Flowchart Working

1. First, we start android camera.
2. We extract frame from camera then detect face.
3. From face extract eyes.
4. We detect 6 points of eyes.
5. We calculate eye blinking ratio then detect drowsy.
6. If drowsiness detected, then we are ringing the phone.
7. Using accelerometer, we detect accident and send SMS to owner with vehicle location.
8. Using GPS, we get latitude and longitude then update this on firebase cloud and owner site we get this location and track vehicle on map.

III. METHODOLOGY

Firebase: Firebase provides the tools and armature you need to develop, grow, and earn money from your app**.** Firebase is a Backend-as-a-Service (Baas). It provides developers with a variety of tools and services to help them develop quality apps, grows their user base,

and earn profit. It is built on Google's infrastructure. Some of the key features provided by firebase which make it solid for usage in the future are Authentication, Realtime Database, Data updating and Notifications.

Authentication: Supports evidence using passwords, phone numbers, Google Map, and more. Firebase Authentication (SDK) can be used to automatically integrate one or more logins into the application.

Realtime Database: Data is synced across all clients in real-time and remains available even when an app goes offline.

Algorithm

Input: Video Frames
Output: Driver's drowsy state

1. Provide input video frames.
2. Extracts the eyes and mouth features and evaluates its state.
3. Compute 'e' and 't', where 'e' is the eye-closure frame ratio in the 60s and 't' is the time duration of eye-closure.
4. Compute 'r' and 'y', where 'r' is the blinking-frequency and 'y' is the total no. of yawning in the 60

if e > 25% then
De = 1
end if
if t > 2.5s and is not yawning then
Dt = 1
end if
if r > 28 or r < 7 then
Dr = 1
end if
if y ≥ 2 then
Dy = 1
end if
Compute D, which is the total value of all the weights.
D= (De + Dt + Dr + Dy)
if T ≥ 2 then
Driver Drowsiness Detected.
Else
aspect ratio
Driver is in the awaken state.
end if

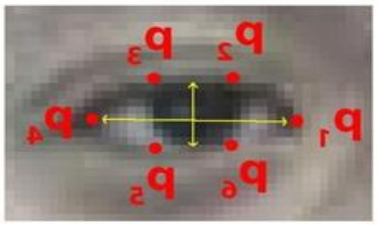


Figure 2: Fully Open Eye

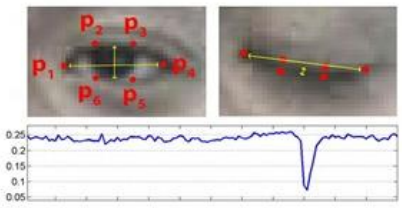
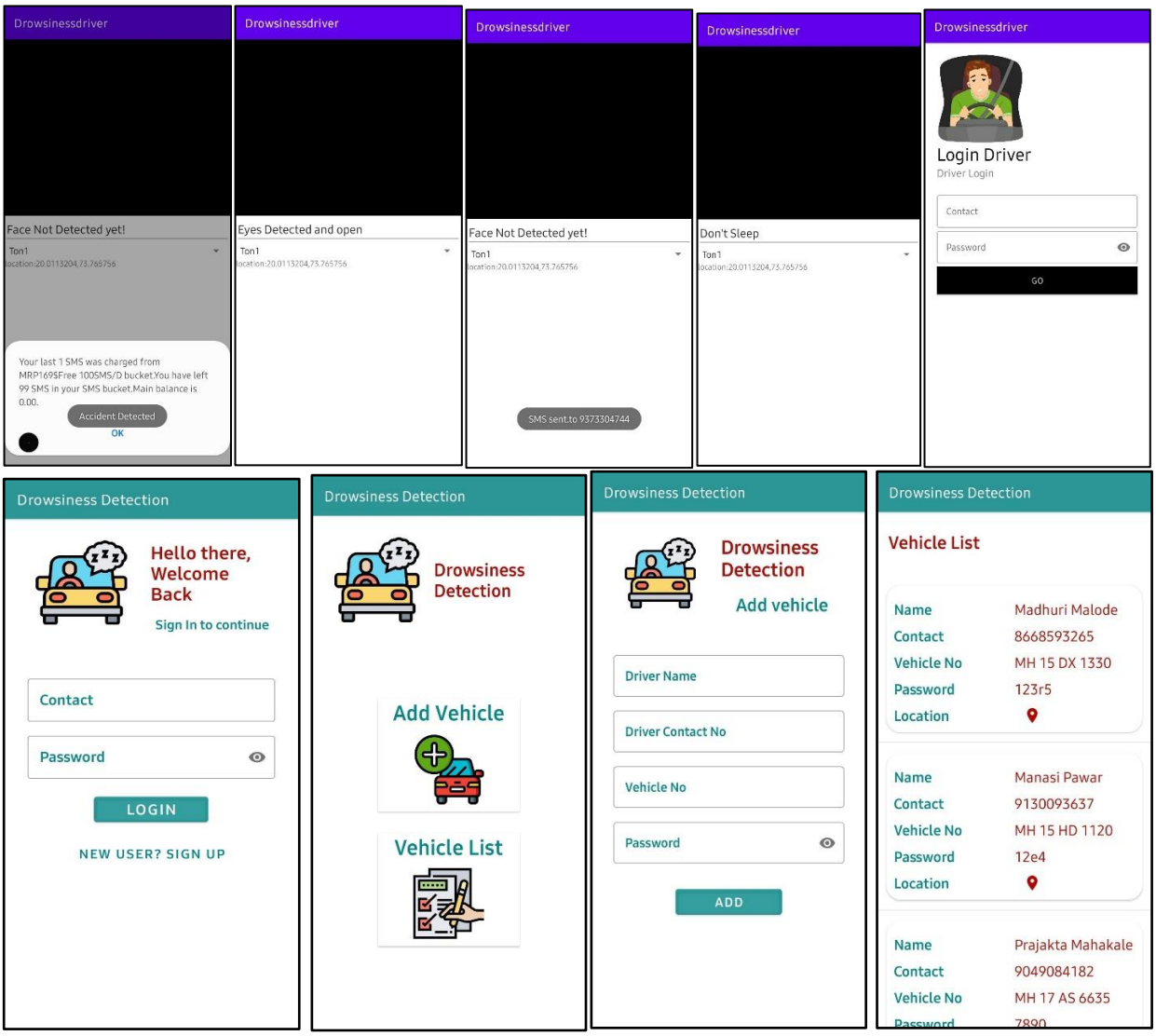


Figure 3: Graph of Eye

IV. RESULTS AND DISCUSSION

The driver's eye blink is observed in this system. When a motorist's eyes are closed for an extended amount of time, the driver is considered drowsy, and an alarm is raised.
Following its implementation, the accident detection and reporting system was tested in several locations. calculates the number of observed locations The technology sends information to owner, including the results of the rider's geographic position, which includes latitude and longitude coordinates, making it easier to locate the rider using Google maps.

It represents the alert message being shown. The owner receives this information via the push bullet application loaded on their phones. Through this, prompt medical assistance might be provided to the rider as soon as feasible.



V. CONCLUSION

In the behavioral approaches various techniques like machine learning, image processing was all used to solve drowsy problem, however despite their success, suffers false alarm, poor dataset design, unreliability, among others. There are many types of DL algorithms, but CNN was chosen due to its operating success in processing large image or video-based data, when compared to other DL algorithms. We define the facial regions of detection based on facial key points. Moreover, we introduce a new evaluation method for drowsiness based on the states of the eyes and mouth. Therefore, DriCare is almost a real-time system as it has a high operation speed.

VI. REFERENCES

[1]. Ana Aguiar, Francisco Maria Cruz Nunes., "Leveraging Electronic Ticketing to Provide Personalized Navigation in a Public Transport Network." IEEE Trans. Intell. Transp. Syst., vol. 13, no. 1, pp. 213–220, Mar. 2012

[2]. B. Ferris, K. Watkins, and A. Borning, "Location-aware tools for improving public transit usability," IEEE Pervasive Comput., vol. 9, no. 1,pp. 13–19, Jan.–Mar. 2010.

[3]. B.Caulfield and M.O'Mahony,"An examination of the public transport information requirements of users," IEEE Trans. Intell. Transp. Syst., vol. 8, no. 1, pp. 21–30, Mar. 2007

[4] International Organization of Motor Vehicle Manufacturers. (2018). Provisional Registrations or Sales of New Vehicles. [Online]. Available: http://www.oica.net/wp-content/uploads/

[5] Wards Intelligence. (2018). World Vehicles in Operation by Country, 2013– 2017. [Online]. Available: http://subscribers.wardsintelligence.com/databrowse-world

[6] National Highway Traffic Safety Administration. (2018). Traffic Safety Facts 2016. [Online]. Available: https://crashstats.nhtsa.dot.gov

[7] G. Borghini, L. Astolfi, G. Vecchiato, D. Mattia, and F. Babiloni, ''Measuring neurophysiological signals in aircraft pilots and car drivers for the assessment of mental workload, fatigue and drowsiness,'' Neurosci. Biobehav. Rev., vol. 44, pp. 58–75, Jul. 2014.

[8] Attention Technologies. (1999). S.a.m.g-3-Steering Attention Monitor. [Online]. Available: https://www.zzzzalert.com

[9] Smart Eye. (2018). Smarteye. [Online]. Available:https://smarteye.se/ [7] J. F. Henriques, R. Caseiro, P. Martins, and J. Batista, ''High-speed tracking with kernelized correlation filters,'' IEEE Trans. Pattern Anal. Mach. Intell., vol. 37, no. 3, pp. 583–596, Mar. 2015.

.