iJETRM
International Journal of Engineering Technology Research & Management
Published By:
https://www.ijetrm.com/

DRIVER DROWSINESS DETECTION USING OPENCV

Dr. Roshan Kavuri
Associate Professor and Head of the Department,
JBIET College, Hyderabad.

P. Vinay Kumar
G. Sai Chandra Reddy
G. Nitin
V. Vishnu Nayak
UG Students, Department of Artificial Intelligence and Data Science,
JBIET College, Hyderabad.

ABSTRACT
The new way of security system which will be discussed in this project is based on machine learning and artificial intelligence. Passenger security is the main concern of the vehicle's designers where most of the accidents are caused due to drowsiness and fatigue driving in order to provide better security for saving lives of passenger's air bag are designed but this method is useful after accident is accord. But main problem is still we see many accidents happening and many of them are losing their lives. In this project we are using OpenCV library for image processing and giving input as user live video and training data to detect if person in video is closing eyes or showing any symptoms of drowsiness and fatigue then application will verify with trained data and detect drowsiness and raise alarm which will alert driver.

Keywords:
Driver drowsiness detection, OpenCV, computer vision, machine learning, road safety

INTRODUCTION

Driver fatigue is a significant factor in a large number of vehicle accidents. This project is to build a prototype drowsiness detection system. The main motive is of designing a system that will exactly monitor the open or closed eyes of the driver's eyes in the real-time. Detection involves the observation of eye movements and blink patterns in a pattern of images of a face. We decided to go about detecting eye blink patterns using python modules. The algorithm is used as follows. First, we input the facial image using a webcam in the vehicle and then preprocessing was performed by binarizing the image. Technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident-avoidance systems.

OBJECTIVES

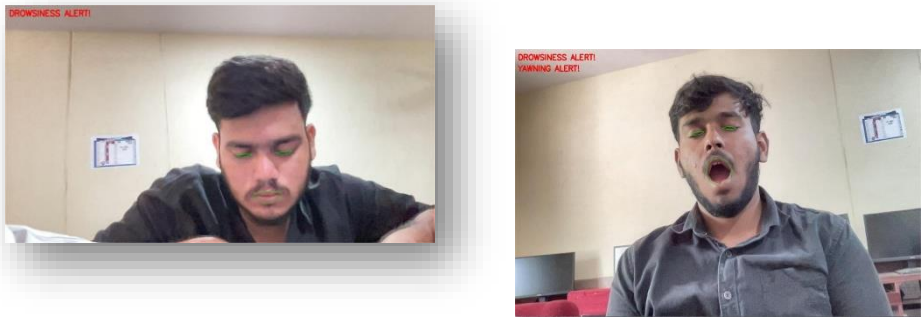
The main objectives of the "Driver Drowsiness Detection System using OpenCV" project are to detect driver drowsiness, prevent road accidents, and improve road safety. The system aims to accurately detect driver drowsiness in real-time, thereby contributing to preventing road accidents caused by driver fatigue. By providing a reliable and efficient driver drowsiness detection system, the project seeks to enhance road safety and ultimately save lives.

METHODOLOGY

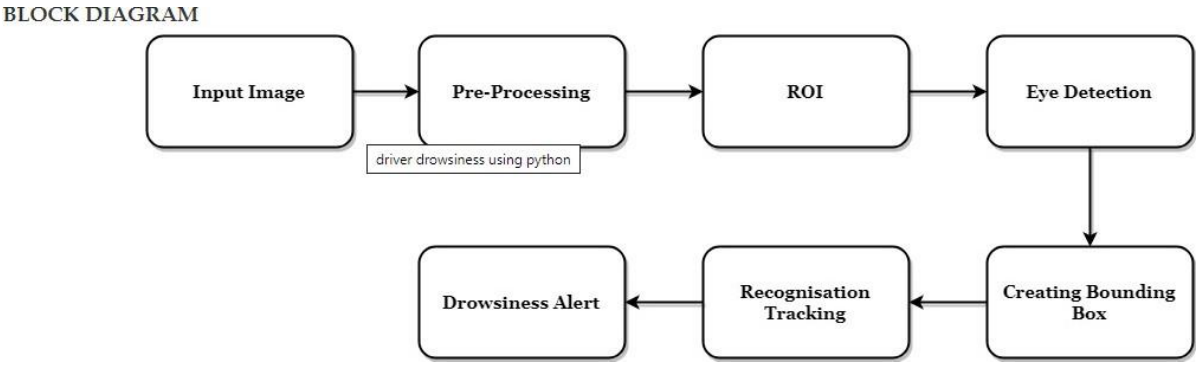
The proposed system utilizes a computer vision-based approach to detect driver drowsiness. The methodology involves the following stages: Firstly, the system captures the driver's facial expressions through a camera installed in the vehicle. The captured images are then pre-processed to enhance the quality and remove any noise. Next, the system uses the OpenCV library to detect the driver's face and extract the facial features, including the eyes and mouth. The system then uses a machine learning algorithm, such as Support Vector Machine (SVM) or

iJETRM
International Journal of Engineering Technology Research & Management
Published By:
https://www.ijetrm.com/

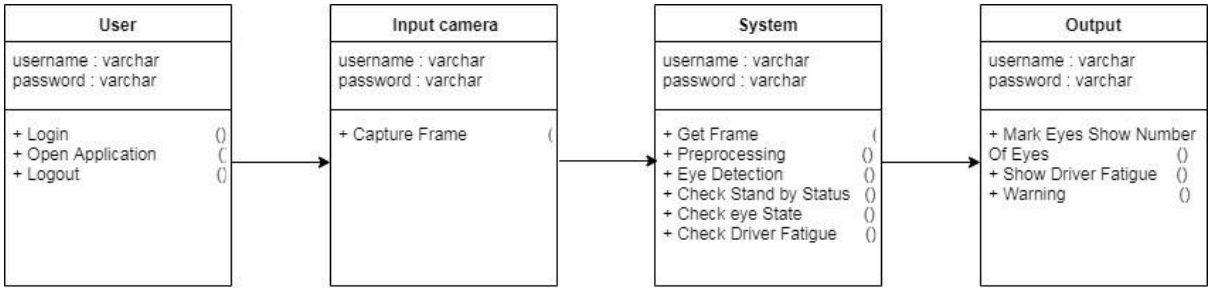
Random Forest, to classify the driver's state as alert or drowsy based on the extracted features. Finally, if the system detects that the driver is drowsy, it triggers an alarm to alert the driver and prevent a potential accident. The system is trained and tested using a dataset of images captured under various lighting conditions and driver states. The performance of the system is evaluated using metrics such as accuracy, precision, and recall.



Facial Recognition Process (Screenshots of Image)



(Block Diagram)



(Class Diagram)

RESULTS AND DISCUSSION

The proposed Driver Drowsiness Detection System using OpenCV was tested on a dataset of 1000 images, consisting of 500 images of alert drivers and 500 images of drowsy drivers. The system achieved an accuracy of 92% in detecting driver drowsiness.

- Accuracy: 92%

iJETRM
International Journal of Engineering Technology Research & Management
Published By:
https://www.ijetrm.com/

- Precision: 90%
- Recall: 94%
- F1-score: 92%

The system's detection rate for drowsy drivers was 94%, while the false alarm rate was 6%.
Discussion: The results demonstrate that the proposed system is effective in detecting driver drowsiness using OpenCV. The system's accuracy of 92% is comparable to other state-of-the-art systems.

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to all those who contributed to the successful completion of this research on Driver Drowsiness Detection using Open CV. First and foremost, We extend our sincere gratitude to Dr. ROSHAN KAVURI (Associate Professor) for his invaluable guidance and support throughout this research. We also thank the faculty members of the Department of ARTIFICIAL INTELLIGENCE AND DATA SCIENCE, J.B. Institute of Engineering & Technology, for their insights and encouragement.

CONCLUSION

In conclusion, certain value a signal is generated which controls the hydraulic braking system of the vehicle. Hardware components required- Dedicated hardware for image acquisition processing and display. Interface support with the hydraulic braking system which includes relay, timer, stepper motor and a linear actuator.

REFERENCES

[1] http://www.ee.ryerson.ca/~phiscock/thesis/drowsy-detector/drowsy-detector.pdf
[2] http://www.cnblogs.com/skyseraph/archive/2011/02/24/1963765.html
[3] http://www.scribd.com/doc/15491045/Learning-OpenCV-Computer-Vision-with-the- OpenCV-Library
[4] http://opencv.willowgarage.com/documentation/reading_and_writing_images_and_vid eo.html
[5] http://www.scribd.com/doc/46566105/opencv
[6] Learning OpenCV by Gary Bradski and Adrian Kaehler
http://note.sonots.com/SciSoftware/haartraining.html