

Drowsy Driver Detection system

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AGENDA

RISKS OF DROWSINESS

ABSTRACT

MAIN CAUSE

SOLUTION

NECESSARY MODULES

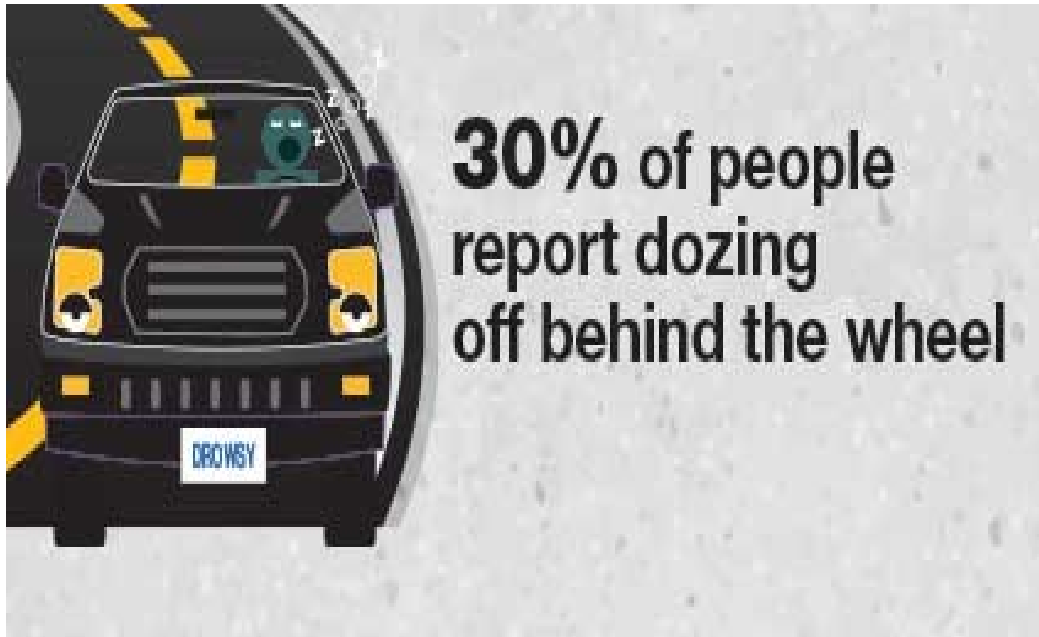
EYE-ASPECT-RATIO

YAWN DETECTION

CONCLUSION

FUTURE SCOPE

RISKS OF DROWSINESS WHILE DRIVING



ABSTRACT

- Road safety is significantly impacted by drowsiness or weariness, which is a primary contributor to auto accidents.
- If drowsy drivers are informed in advance, many fatal incidents can be avoided.
- Over the past 20 to 30 years, the number of road accidents and injuries in India has been rising alarmingly.

Main cause

- According to the experts, the main cause of this issue is that drivers who do not take frequent rests when travelling long distances run a great danger of becoming drowsy, which they frequently fail to identify early enough.
- There are several drowsiness detection techniques that track a driver's level of tiredness while they are operating a vehicle and alert them if they are not paying attention to the road.

Solution

- Creating a system that detects drowsiness.
- Calculate Eye Aspect Ratio.
- Compare Eye Aspect Ratio with Threshold Frequency.
- Detect Yawn of Driver.
- Compare it with the Threshold frequency.

Necessary Modules

- OpenCV: OpenCV is a library function for Computer Vision which was written and originally used in C++.
- Dlib: Dlib is a library which is written in C# and includes tools that deal with Data Mining, Data Structure, Machine Learning, Image Processing etc.

Modules contin...

scipy.spatial.distance: This module is used to calculate the Euclidean distance between two points, which will be used to measure the eye aspect ratio (EAR) in the script.

imutils.video: This module is used to capture video frames from the webcam.

imutils.face_utils: This module contains utility functions for working with facial landmarks. It is used to extract the coordinates of the eyes and mouth.

threading.Thread: This module is used to create a separate thread for playing an alarm sound.

numpy: This module is used for numerical computations.

Modules contin...

argparse: This module is used to parse command line arguments.

time: This module is used for timing purposes.

dlib: This module is used to detect facial landmarks, which are used to determine the position of the eyes and mouth.

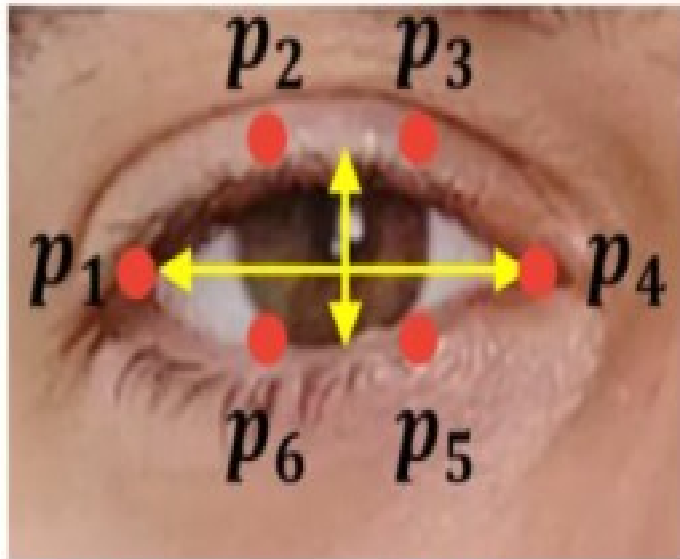
cv2: This module is used for image processing and computer vision tasks.

pygame: This module is used to play an alarm sound when the driver becomes drowsy.

os: This module is used to interact with the operating system.

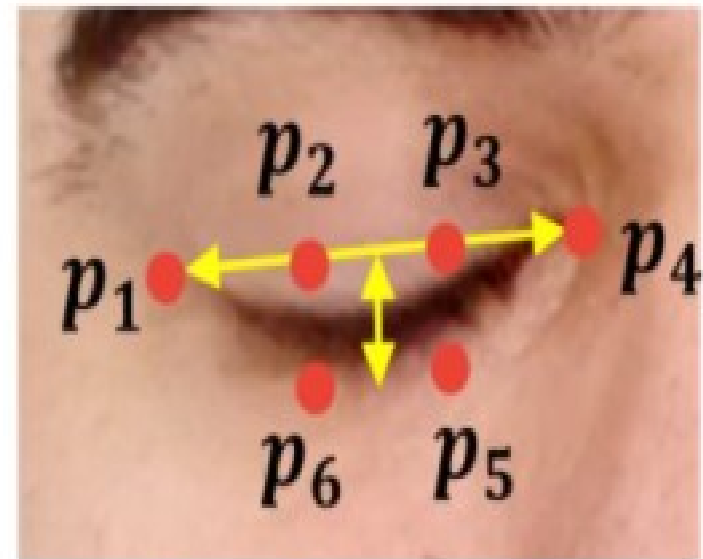
tkinter: This module is used to create a graphical user interface (GUI) for the script.

Eye Aspect Ratio - calculation



**Open eye will have
more EAR**

$$EAR = \frac{\|p_2 - p_6\| + \|p_3 - p_5\|}{2\|p_1 - p_4\|}$$



**Closed eye will
have less EAR**

Yawn Detection

- The degree of mouth openness is extracted on the basis of mouth features, to determine driver's yawning state.



CONCLUSION

- ✓ The drowsiness detection System is mainly useful to the drivers as well as the users.
- ✓ This helps the drivers to reduce the risk of accidents and also the users in this case the students /employees to stay alert.
- ✓ The "Drowsiness detection System " is an easy and also an efficient way to manage the safety of the drivers.

Future Scope

- × Our model can be improvised by the following methods:
- × Learning to detect faces and eyes in varied lighting conditions, such as at night with infrared lights.
- × In addition to this, the model should also be able to recognize drowsy eyes with sunglasses.



Thank you!