DRIVER DROWSINESS DETECTION

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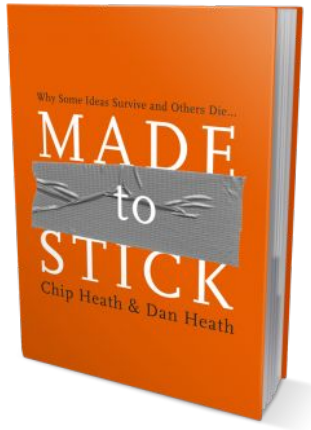
Selling the idea

Nearly 1.25 million people die in road crashes each year worldwide, on average 3,287 deaths a day.

And on top of that, road accidents caused by drivers being drowsy are one of the most common issues faced by road safety departments.

In India, of all road related deaths, 21% happened due to careless driving caused by driver fatigue.



More than 1 million people got into car accidents in 2014.

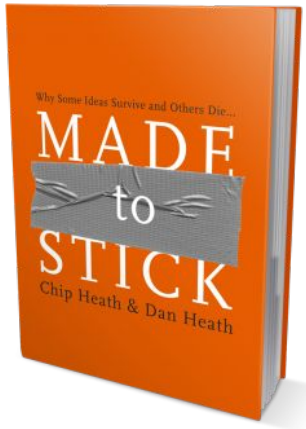
THAT'S MORE THAN THE POPULATION OF COUNTRIES LIKE BAHRAIN AND BHUTAN COMBINED

Reason behind the idea

Detecting fatigueness in drivers brings a challenge as there is no proper tests like alcohol or drug test to measure the drowsiness of the drivers.

When our body experiences more fatigue, we tend to underestimate it, endangering all the people on the road.

That's why we came up with something that will help tackle the problem at hand with an optimized solution



Meet Aquib

He drives from Agra to a town in Haryana and back, twice a week.

He wants to support his family, and so he puts in as many shifts as he can. He, most of the time, has to drive for 16 hours in a day.

This lead to him being dangerously tired during some of his trips risking the future of his family and of other people on the road.

Meet Rajesh

He is working as a full time driver for a “Movers & Packers” company in Kolkata.

His daily routine consists of driving load vehicles from one location to other but the long hours got to him and he met an accident while driving for his job.

Causes! Factors responsible for drowsiness in drivers.

- Sleep deprivation
- Sleeping disorders
- Driving continuously without rest
- Drunk while driving
- Commercial drivers are more prone

The best drivers are aware that they must be beware.

After getting to know about their problem, it was quite clear to us about what needed to be done.

We need a low cost solution to solve this problem which has plagued our country for as long as we can remember.

PROJECT OBJECTIVE

Detecting fatigue and drowsiness levels in the drivers as a deterrent to road accidents caused by drivers sleeping at the wheel

The Driver Drowsiness detector can detect **FACES of all COLOR** from German and Japanese to Indian and Zulu

Bottom line is we need a solution to this problem for everyone. No government in the world has clear rules to tackle this..

1. Methods

Various techniques have been advised for detecting fatigue in drivers, but we have implemented the following concepts in order to develop the project.

- ➔ **Facial Point Detection**
- ➔ **Euclidean Distance Evaluation**
- ➔ **Calculating Aspect Ratio**
- ➔ **Analysing result for any change**

Facial Point Recognition

First, the webcam will capture the video and will be analysed further for eye detection.

Next, the system will extract the features and look for the facial points near the eye boundaries.

How we solved what we solved

Dlib is used to detect facial features using 68 predefined facial features.

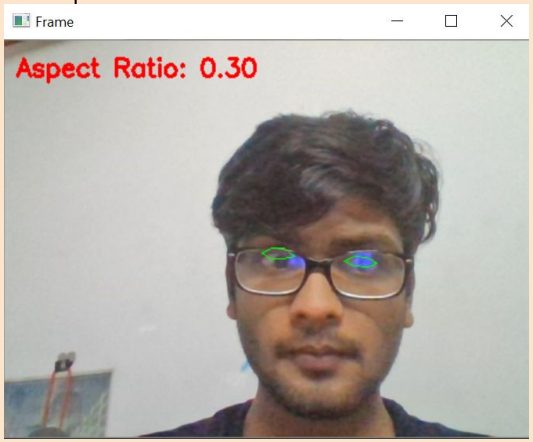
Euclidean distance between the left and right eyelids is calculated.

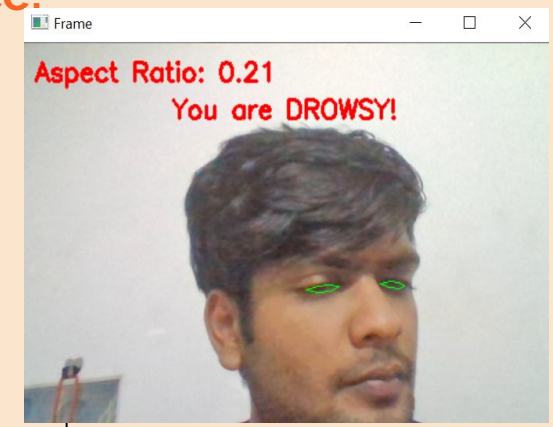
If the EAR is less than 0.25 for 48 consecutive frames, alarm is sounded.

Screenshots

Good Light, Straight Face. WIth Glasses

Non Drowsy



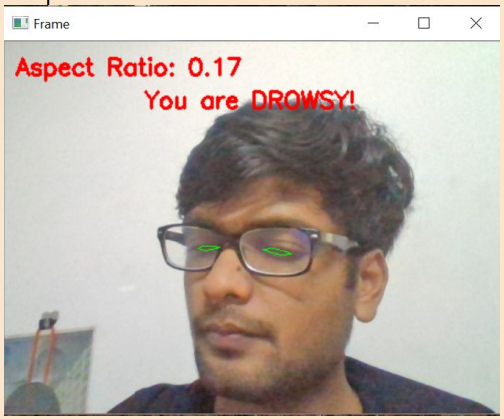


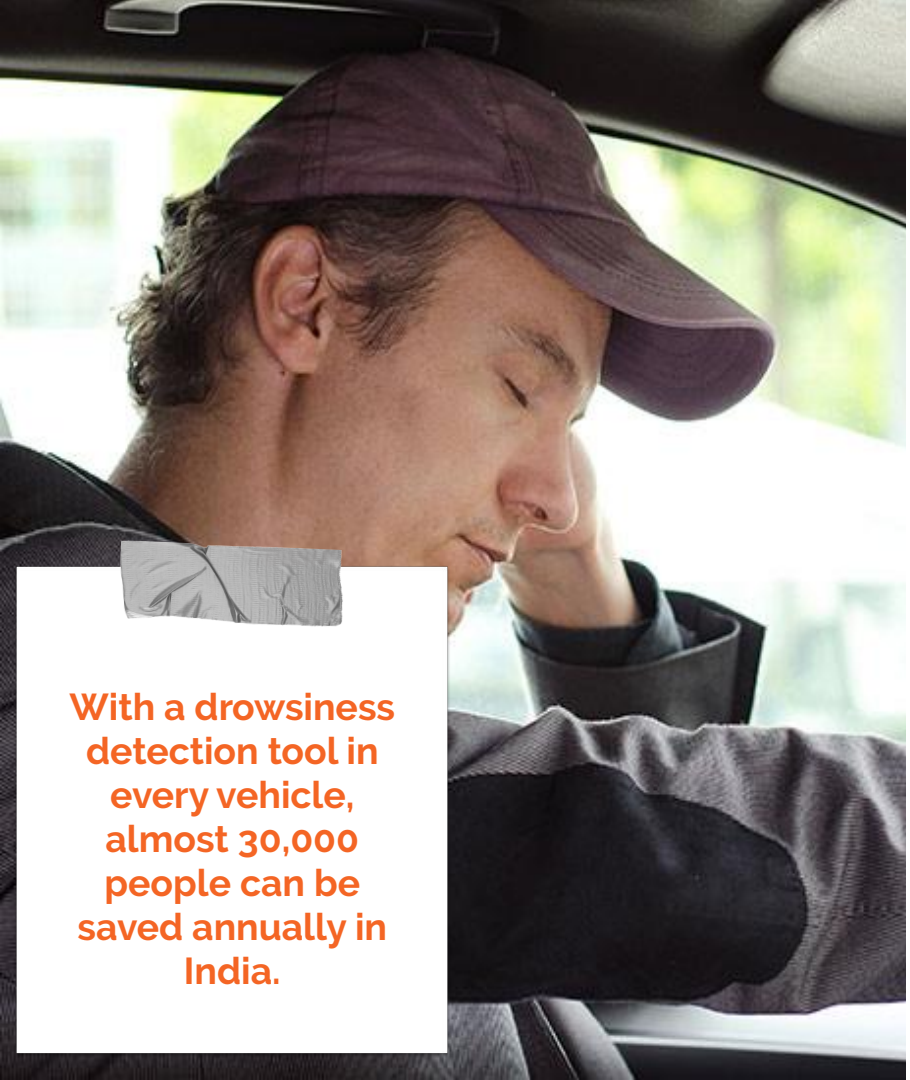
Drowsy State

Good Light, Tilted Face, No Glasses

Good Light, Tilted Face, WIth Glasses

Drowsy State





With a drowsiness detection tool in every vehicle, almost 30,000 people can be saved annually in India.

Conclusion

We wrote a script to solve this widespread problem efficiently. With the increasing population there are a lot more people on the road. Their safety needs to be ensured and this project is one such step that needs to be taken in achieving that.

Future Scope

The model can be improved incrementally by using other parameters like blink rate, yawning, state of the car, etc. If all these parameters are used it can improve the accuracy by a lot.

Same model and techniques can be used for various other uses like Netflix and other streaming services can detect when the user is asleep and stop the video accordingly. It can also be used in application that prevents user from sleeping

The problem of fatigue related accidents can be solved if EVERYONE, including the government recognises it.