

SAVE THE DROWSY DRIVER

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ABSTRACT

- The major fraction of the accidents are caused due to the drowsiness of the drivers. Due to the drowsiness, the drivers lose their consciousness and the vehicle runs out of control and leads to major accidents. In this project we propose a system that can detect the drowsiness of the driver and alert system to make the driver conscious.
- The Drowsy Driver Detection System has been developed using a vision based concepts. The system uses a small camera that points directly towards the driver's face and monitors the driver's eyes in order to detect drowsiness. In such a case when drowsiness is detected, a warning signal is issued to alert the driver. In this way we can control the accidents due to drowsiness to a far extent.

INTRODUCTION

- The Biggest problem regarding the increased use of vehicles is the rising number of road accidents, and a major fraction of it is due to the drowsiness of the driver.
- The increasing number of accidents led to the development of Intelligent Transportation Systems (ITS). ITS includes driver assistance systems like Adaptive Cruise Control, Park Assistance Systems, Pedestrian Detection Systems, Intelligent Headlights, Blind Spot Detection Systems, etc.
- But there isn't a system that can detect whether the driver is sleepy or not.
- If we can detect whether the driver is drowsy, then we can alert him so that he gives more attention to drive safe.
- This project focuses on a driver's drowsiness detection system using vision based system.

LITERATURE REVIEW

S.No	TITLE	KEY CONCEPTS	MERITS	DEMERITS
1	PERCLOS	<ul style="list-style-type: none">• Perception of face and face pursuit.• Position of eye and eye pursuit.• Calculation of percentage of eyelid closure.	<ul style="list-style-type: none">• It also detects facial expressions, yawns, and movements of the head	<ul style="list-style-type: none">• The algorithm is very complex.• Chances of errors is very high.
2	CAMSHIFT	<ul style="list-style-type: none">• CAMSHIFT algorithm• Calculate the mass Centre (X_c, Y_c) of the window.	<ul style="list-style-type: none">• It is an efficient and light weight tracking algorithm.	<ul style="list-style-type: none">• It is not efficient in tracking objects in complex situations.

S.No	TITLE	KEY CONCEPTS	MERITS	DEMERITS
3	HAAR TRAINING	<ul style="list-style-type: none"> • Open CV library • Pixel wise recognition. 	<ul style="list-style-type: none"> • Versatile boosting • Only uses the relevant highlights of the image 	<ul style="list-style-type: none"> • The algorithm is complex. • Chances of errors are higher than the rest.
4	VIOLA JONES ALGORITHM	<ul style="list-style-type: none"> • It also uses HAAR based features. • Integral image formation. 	<ul style="list-style-type: none"> • Checks all four corners of the image. • XML classifier is used 	<ul style="list-style-type: none"> • Algorithm is so simple and prone to errors.

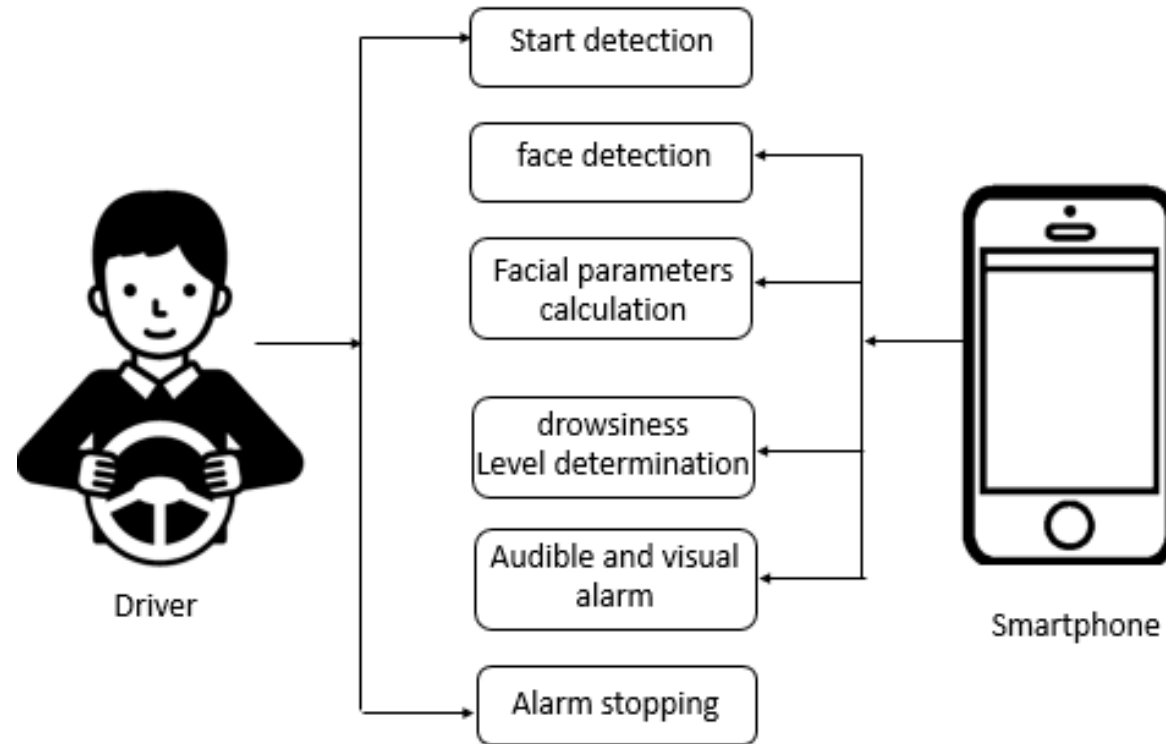
PROBLEM DEFENITION

- Increase in the number of vehicles into the roads results in the huge increase in the number of accidents.
- A major portion of these accidents are caused due to the drowsiness of the driver.
- The driver falls asleep and looses the control over the vehicle due to unconsciousness, and this leads to serious accidents.
- This drowsiness can be due to different factors like sleeplessness of the driver, over workload, tiredness, lack of rest etc.
- These accidents often occurs in long straight roads, as the driver have no much work in controlling the vehicle which leads to inactivity and drowsiness.

PROPOSED SOLUTION

- In the proposed method we are using live video of driver to detect drowsiness.
- The face and eyes of the driver will be continuously tracked and when the drowsiness is detected an alarm will be produced to wake the driver.
- The eye aspect ratio will be used to measure the drowsiness. We will use opencv to implement the image processing. The eye aspect represent the state of eye. We use this ratio to check drivers are in closed state or not. If the eyes stay closed for some time then we consider the driver as drowsy.
- Deep neural networks are used for the detection of the eyes.
- Euclidean equation is used to calculate the distance of the eyes.

SYSTEM ARCHITECTURE

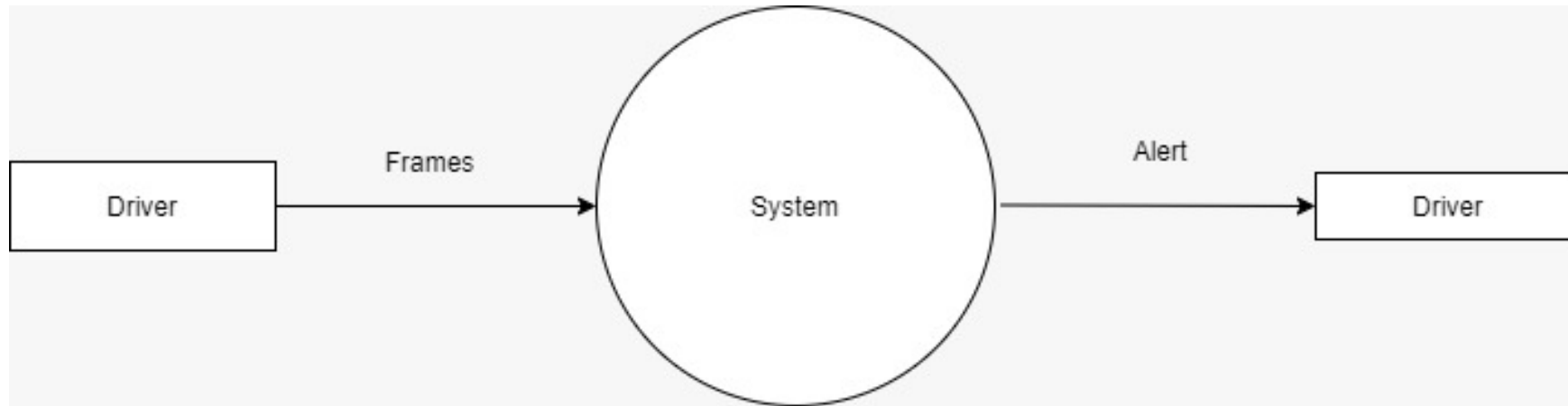


MODULES

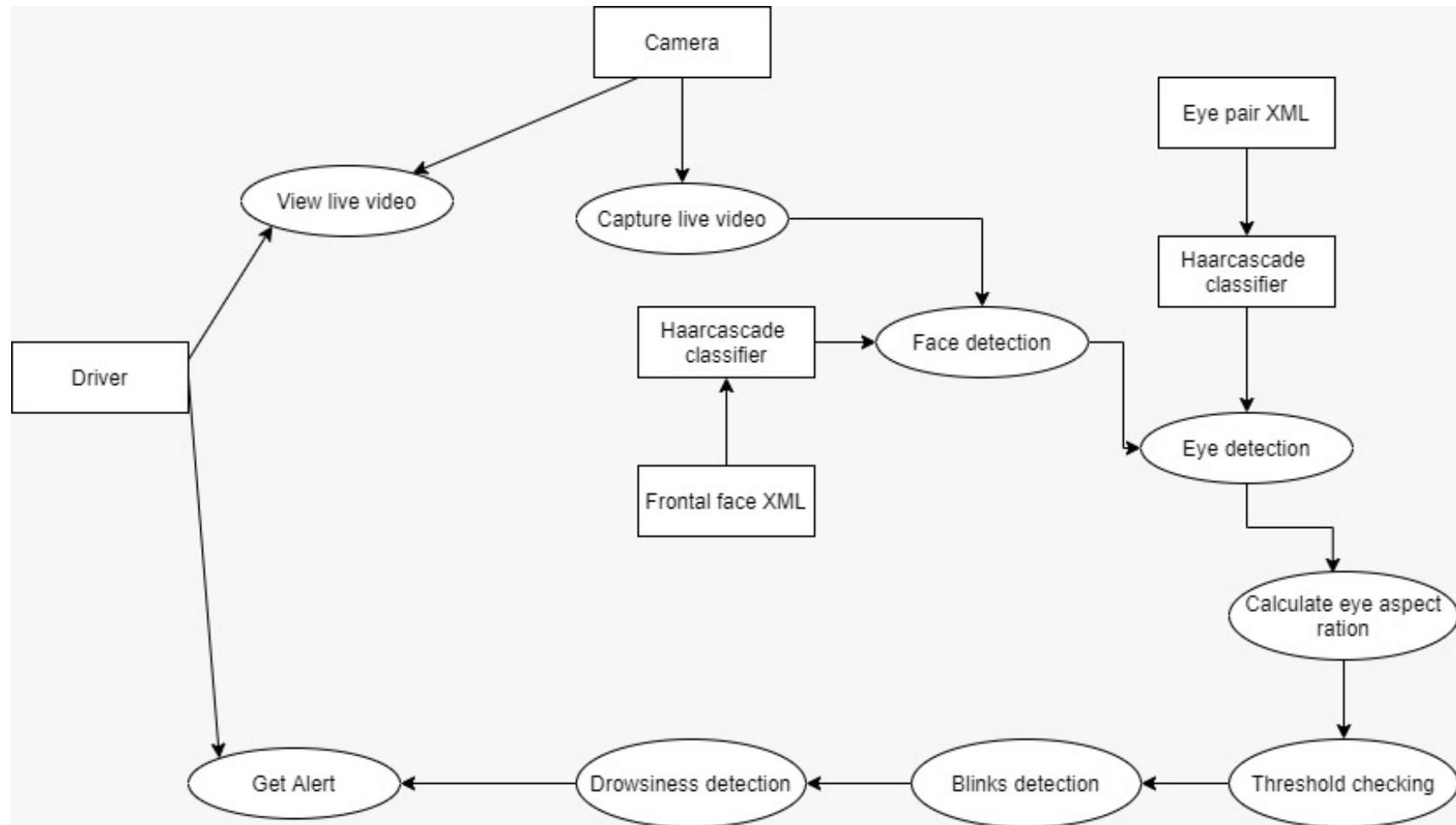
- Face Detection
 - Haarcascade classifier will be used to detect face from a frame.
 - Facial Landmark Extraction.
 - Draw rectangle around the detected face.
- Eye Detection
 - Eye is detected using Haarcascade classifier.
 - Landmarks used to draw contours around the face.

- Eye Aspect Ratio calculation
 - Left landmarks to calculate left eye aspect ratio.
 - Right landmarks to calculate right eye aspect ratio.
 - Overall eye aspect ratio is calculated.
- Drowsiness Detection
 - Compare eye aspect ratio with threshold.
 - If it is higher than threshold append counter.
 - If counter gets higher than counter threshold produce alert.
- Front end: Python (Tkinter)
- Backend: Python
- Monochrome Camera

DFD LEVEL 0



DFD LEVEL 1



CONCLUSION

- Here in this method, we propose a better accurate system which detects the drowsiness of drivers.
- We can also add features like sending GPS location data to particular people that the user can set in the app, gyroscope to detect an accident and alert the nearest police station etc.
- An alert system is made so that the driver can be warned about his drowsiness and prevent him from further driving or taking a refresh break.
- In this way we can prevent a large number of accidents that are caused due to the drowsiness of the driver. This also leads to the overall average number of accidents across the globe.

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THANKYOU 😊