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# Driver Sleepiness Detection using Python and Open CV

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**ABSTRACT:** This paper presents a solution for managing and develop a system for driver sleepiness detection using block chain technology. In recent years driver fatigue is one of the major causes of vehicle accidents in the world. A direct way of measuring driver fatigue is measuring the state of the driver i.e. drowsiness. This project is aimed towards developing a prototype of drowsiness detection system. There is an alert system which sends email to concerned person when the driver drowsiness is detected by capturing the image of person as an attachment. This avoids the driver to violate the rules and also to be safe at the same time. we develop this application using python and we use open cv library for image capturing, processing and other image related operations. We use haar-cascade algorithms for detecting drowsiness.

**KEYWORDS:** Dlib, Eye aspect ratio, Mail .

## I. INTRODUCTION

The attention level of driver degrade because of less sleep, long continuous driving or any other medical condition like brain disorders etc. Several surveys on road accidents says that around 30 percent of accidents are caused by fatigue of the driver. When driver drives for more than normal period for human then excessive fatigue is caused and also results in tiredness which drives the driver to sleepy condition or loss of consciousness. motivates how face is detected and how eye detection is performed for automotive application. modules. This is an application which aims to solve the problem of Driver Drowsiness, this System using Image Processing, capturing drivers eye state using computer vision based drowsiness detection systems have been done by analysing the interval of eye closure and developing an algorithm to detect the driver's drowsiness in advance and to warn the driver by in vehicles alarm. This section and their detection is necessary for assessing driver drowsiness.

## II. RELATED WORK

The objective of the different techniques used in the field of driver drowsiness detection is to represent and detect the signs of the driver's drowsiness. This technique is based on the behavior and appearance of the driver or both. Other studies were conducted on the health of drivers, in order to analyze when the driver is no longer able to drive and detect the first signs of fatigue for anticipating the onset of drowsiness to alert the driver that it is necessary to take a break. For this type of method, it uses Electroencephalography (EEG), which makes measurements using the captures pasted directly on the skin of the driver by measuring heart rate, body temperature, and other measurements depending on the type of work. In addition, another type of capture is installed in a car directly; for example, it captures the measurements of the temperature inside and outside the car. All of these calculated measurements are used to feed a

vector model, which classifies the measured values between alert and extreme fatigue states; this type of work gives good results. Still, industrial-scale use, especially for ordinary drivers, is costly and not practical for everyday use. Work is also carried to detect drowsiness. The solution proposed is a combined system for fatigue detection and the detection of unwanted driver behavior during driving. Using the Kinect for Windows Developer Toolkit, Kinect has made it possible to detect simple postures by detecting the position of the driver's body limbs and analyzing their movement to detect the postures that are closest to a driver's fatigue behavior.

### III. METHODOLOGY

#### 3.1 Modules

This application consists of two modules, They are:

- 1) Drowsiness detection: It is the one which manages all the activities. First it will detect the eye lids and calculate EAR value to detect sleepiness.
- 2) Alerting: it is the system where it will send an alert message through mail with attachment of image, after detection of sleepiness.

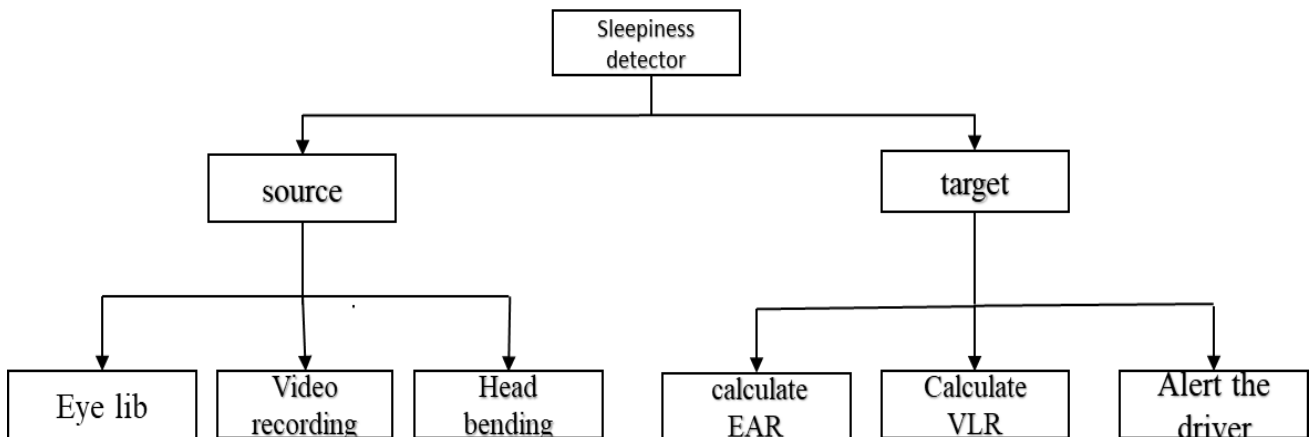


Figure 1: Modular design

#### 3.2 Pre-Requisites

##### CONDA

Conda is an open source, cross-platform, language-agnostic package manager and environment management system that installs, runs, and updates packages and their dependencies. It was created for Python programs, but it can package and distribute software for any language (e.g., R), including multi-language projects. The conda package and environment manager is included in all versions of Anaconda, Miniconda, and Anaconda Repository.

##### Python

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built-in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse.

The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed. Often, programmers fall in love with Python because of the increased productivity it provides. Since there is no compilation step, the edit-test-debug cycle is incredibly fast. Debugging Python programs is easy: a bug or bad input will never cause a segmentation fault. Instead, when the interpreter discovers an error, it raises an exception. When the program doesn't catch the exception, the interpreter prints a stack trace. A source level debugger allows inspection of local and global variables, evaluation of arbitrary expressions, setting breakpoints, stepping through the code a line at a time, and so on. The debugger is written in Python itself, testifying to Python's introspective power. On the other hand, often the quickest way to debug a program is to add a few print statements to the source: the fast edit-test-debug cycle makes this simple approach very effective.

**Machine Learning**

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.

The process of learning begins with observations of data, such as complex, direct experience, or instruction, in order to look for patterns in data and make better decisions in the future based on the examples that we provide. The primary aim is to allow the computers learn automatically without human intervention or assistance and adjust actions accordingly.

**Open CV**

OpenCV (Open Source Computer Vision Library: <http://opencv.org>) is an open-source BSD-licensed library that includes several hundreds of computer vision algorithms. The document describes the so-called OpenCV 2.x API, which is essentially a C++ API, as opposed to the C-based OpenCV 1.x API (C API is deprecated and not tested with "C" compiler since OpenCV 2.4 releases). OpenCV has a modular structure, which means that the package includes several shared or static libraries.

**3.3 Proposed System**

In this paper, it is proposed to develop a system for driver sleepiness detection using block chain technology. In recent years driver fatigue is one of the major causes of vehicle accidents in the world. A direct way of measuring driver fatigue is measuring the state of the driver i.e. drowsiness. This project is aimed towards developing a prototype of drowsiness detection system. For detection of drowsiness the per closure value of eye is considered. So when the closure of eye exceeds a certain amount then the driver is identified to be sleepy.

This is an alert system which sends email to concerned person when the driver drowsiness is detected by capturing the image of person as an attachment. This avoids the driver to violate the rules and also to be safe at the same time. We develop this application using python and we use open cv library for image capturing, processing and other image related operations. We use haar-cascade algorithms for detecting drowsiness.

**3.4 Architecture**

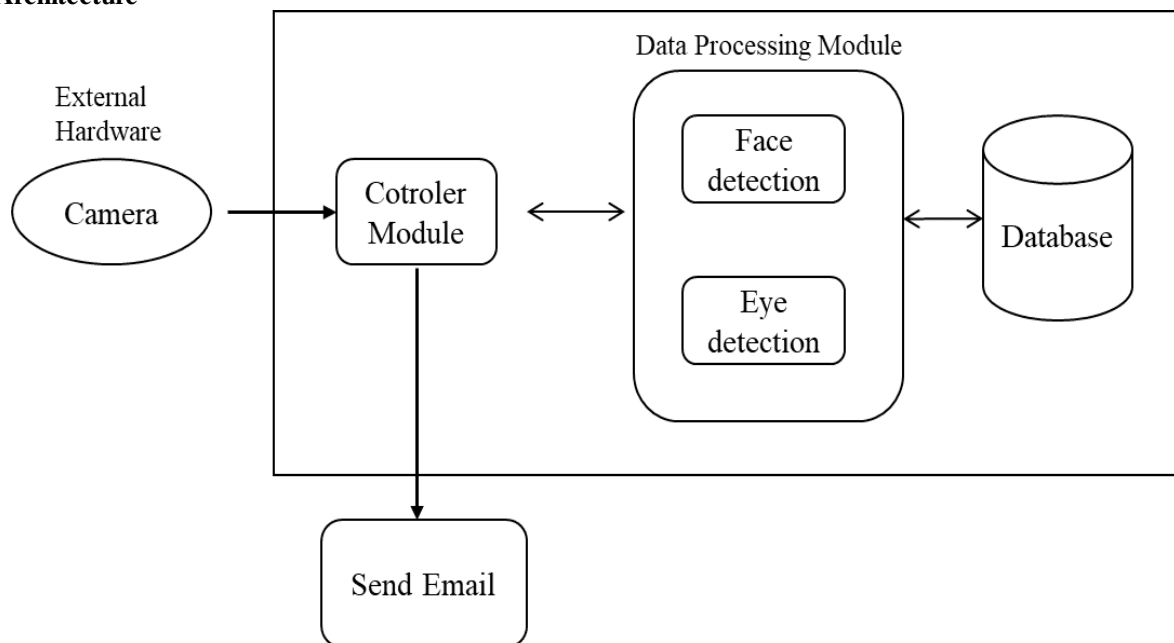


Figure2: Architectural Diagram

Architectural design is a graphical representation of a set of concepts that are part of architecture including the principles, elements and components.

#### IV. RESULT



Figure3: Eye Detection

Eye Detection: This is first step. It apply facial landmark localization to extract the eye regions from the face.



Figure4: Eye State Analysis

Eye State Analysis: It represents closed eye state. It compute eye aspect ratio to determine if the eyes are closed.



Figure5: Drowsiness Detection

Drowsiness Detection: It represents image analysis. It will alert the driver if the eyes have been closed for a sufficiently long enough time.

```
pi@raspbcrypi: ~/Desktop
File Edit Tabs Help
SMedd3ad0a5c4d4adc90020e0972e25e45
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
SM52004a145af340dfb90d1356369c3ad7
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
in args alarm
SM0d2e6034cc954717bb2e20ed99b95163
```

Figure5: Warning Message

Warning Message: It represents alerting. It will alert the driver by sending an email.



## V. CONCLUSION

This project provides the approach of machine learning for drivers into a single compact Application. The advantage of this device is that it can be easily portable due to its less weight and size. The framework and comprehend it's focal points and the fact that it takes care of the issue of stressing out for individuals having fatigue-related issues to inform them about the drowsiness while driving.

The system can be further improved incrementally by using other parameters like blink rate, yawing, state of car etc. All these parameters are used it can improve the accuracy rate. Future work on the project by adding sensor to track the heart rate in order to prevent accidents caused due to sudden heart attacks to drivers.

## REFERENCES

- [1] P.R Tabzi and R.A. Zarofi "Computationally efficient face detection", 2013 International Conference on Semantic Technology and Information Retrieval 28-29 June 2011, Putrajaya, Malaysia
- [2] Jain "Face Detection in Colour Images ", 2019 World Congress on Computing and Communication Technologies.
- [3] S.B Shrokeetal (2018). "Yawing Detection For Monitoring Driver Fatigue Based On Two Cameras". The international Tamil Internet 2018 Conference and Exhibition (TI2018).
- [4] Pankaj Pathak, "Embeded Based Drowsiness Detection Using EEG Signals" , International Conference on Electronics, Communication and Aerospace Technology ICECA 2017.
- [5] Vasanti.G and Ramesh Babu, "Sleepy and Unsafe", 2018 IEEE 27th International Conference on Enabling Technologies: Infrastructure for Collaborative Enterprises.



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