A Project ETE Report

on

DRIVER DROWSINESS DETECTION SYSTEM

Submitted in partial fulfillment of the requirement for the award of the degree of

Bachelors Of Technology (Computer Science And Engineering)

GALGOTIAS UNIVERSITY

(Established under Galgotias University Uttar Pradesh Act No. 14 of 2011)

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INDIA
DECEMBER,
2021

Abstract

Machine learning is playing a very important role in modern technologies. It is an application
of artificial intelligence as we know artificial intelligence is how system can learn automatically again develop without explicit planning. Drowsiness and fatigue of driver are among important causes of road accident. According to world statistics, every year we see approximately 1.3 millions of people dies in road accident. An advanced Driver Drowsiness Detection System(DDDS) module has been introduced to reduce the number of accidents due to driver fatigue and hence it helps to reduce transport safety. This program interacts automatic detection of driving drowsiness based on visual detail and artificial intelligence. We proposed an algorithm to detect, track and analyze both driver face eyes to measure PERCLOS. Today, many activities require long-term concentration. Drivers should always be close by eye on the road, so that they can respond to sudden events quickly. Driver fatigue is usually the exact cause of many road accidents. Therefore, there is a need to develop programs that will detect and inform the driver of his or her negative attitude, which can greatly reduce it the number of car accidents related to fatigue. However, the development of such programs experiences many difficulties related to the rapid and accurate recognition of symptoms of driver fatigue. One of the technological possibilities of using driver drowsiness systems is to use Vision-based approach. Professional features of using a vision detection system Drowsiness is discussed. Drowsiness and fatigue of drivers are some of the important causes of road accidents. Every year, they increase the number of deaths and injuries among people worldwide. this paper, the Advanced Driver Assistance System (ADAS) module was introduced to reduce the number of accidents due to driver fatigue and thus increase transport safety; this the system deals with automatic driver drowsiness detection based on visual information and Performance Wisdom. These tools are used for Driver Drowsiness

Detection System like Python: python, Libraries . Numpy. Scipy. playsound.dlip.lmutills. under the light of what has been mentioned above ,the identification of the driver drowsy state given 1. Face detection 2. Eyes Location 3. Face and eyes tracking .4. identification of the eye states. The drowsiness detection and correction system developed is capable of detecting drowsiness in a rapid manner. The system which can differentiate normal eye blink and drowsiness which can prevent the driver from entering the state of sleepiness while driving. The system works well even in case of drivers wearing spectacles and under low light conditions also. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for about two seconds, the alarm beeps to alert the driver and the speed of the vehicle is reduced. We plan to further work on the project by adding a sensor to track the heart rate in order to prevent accidents caused due to sudden heart attacks to drivers. By doing this many accidents will reduced and provides safe life to the driver and vehicle safety. A system for driver safety and car security is presented only in the luxurious costly cars. The model can be continuously developed using other similar parameters blinking level, yawning, vehicle position, etc. If all these restrictions app l can improve accuracy a lot. We plan to continue the work on the project by adding a sensor to track heartbeat to prevent accidents caused by a sudden heart attack motorist attacks. The same model and techniques can be used for a variety of other things Netflix and other streaming services can detect when a user is asleep and pause the video accordingly. It can also be used in an app that prevent user from sleeping.

TABLE OF CONTENTS

Title

Abstract

Chapter 1 Introduction

1.1 Formulation of Problem

1.2 Tools and Technology Used

1.3 Activity Diagram

Chapter 2 Literature Survey

Chapter 3 Proposed System

Chapter 4 Result

References

CHAPTER-1
Introduction

1.1 Formulation of the problem

Currently, transportation systems are an integral part of human activities. We can all be victims of drowsiness while driving, just after a short night's sleep, physical condition or during a long trip. The sleep deprivation lowers the driver's level of alertness to produce dangerous situations and increases the potential for accidents. Drowsiness and fatigue are some of the most important causes of road accidents. Every year, they increase the number of deaths and injuries worldwide. it is important to use new technologies to design and build systems that can capture monitor drivers and measure their level of attention throughout the entire driving process. Machine learning is associated with the discovery of the drowsiness computer science (AI) offers systems are flexible for automatic learning and developed for information their absence clearly organized. The most possible differences are between Python and the system especially in programs we tend to use conditional statements to disclose tell the system to detect the trauma of those situation and, Python by machine learns and develops information primarily the user should train the data set as well machine language learns mechanically in ways independently. Python focuses on an event for pc programs that will access information and use it for self-study. the learning process begins with observation or information, for example, specific technologies, or instructions, in order to identify patterns of knowledge and create higher choices the future supported the examples we give. This is the kind of learning process widely classified as supervised education. The main purpose of this type of learning is that the system already knows the output is simply the components of the system itself refers to the result of this type of learning also shows that the system also learns by response. These tools are used for Driver Drowsiness Detection System like Python: python, Libraries . Numpy. Scipy. These technology are used like Steering pattern monitoring Primarily uses steering input from electric power steering system. Monitoring a driver this way only works as

long as a driver actually steers a vehicle actively instead of using an automatic lane-keeping system. 1.Vehicle position in lane monitoring

Uses lane monitoring camera. Monitoring a driver this way only works as long as a driver actually steers a vehicle actively instead of using an automatic lane-keeping system. 3.Driver eye/face monitoring Uses computer vision to observe the driver's face, either using a built-in camera or on mobile devices.

1.2 Tools and Technology used:

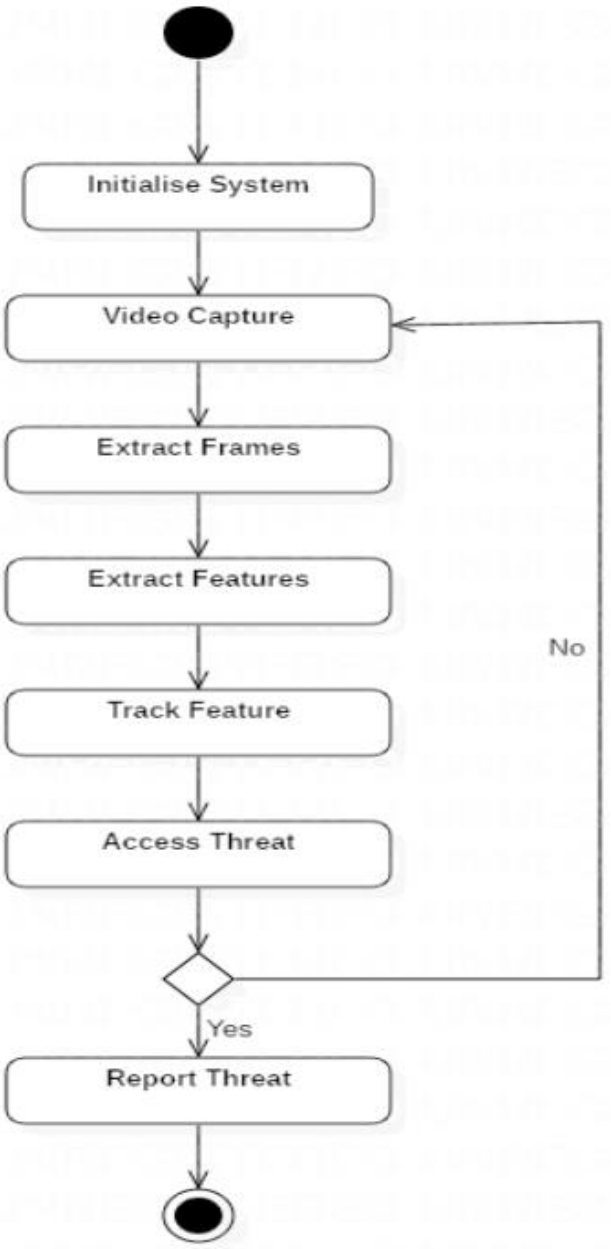
a. PYTHON - Python is a translated, high quality, standard planning language. Python's design philosophy emphasizes code read ability and its remarkable use of white space. Its language building and object-oriented approach aims to help program planners write clear, logical code for small and large projects. Python i dynamically type AND supports multiple editing paradigms, including process, object orientation, and application.

b. IMAGE PROCESSING - In computer science, digital image processing is the use of computer algorithms to perform image processing on digital.

c. d. MACHINE LEARNING - Machine learning is a science learning about algorithms and mathematical models of computer systems in order to perform a task successfully without the use of explicit language directions, depending on patterns and straightening position. It is considered a subset of Artificial Intelligence. Machine learning algorithms are being developed statistical data based sample sample, known as "training data",to make predictions or decisions without being told openly.

1.3 Activity Diagram

5.2 ACTIVITY DIAGRAM



Chapter 2 Literature Survey

1. System Review

This study was designed to understand the need and requirements the general population, and in doing so, we went through different sites as well applications and looked at basic data. Based on this data, we have done research that has helped us to discover new ideas and to do different things arrangements for our work. We have come to the conclusion that it is necessary such a request and I have seen that there is a high level of progress in this Field too. The upgraded system is a real-time system. It uses image processing to detect eye and face. A HAAR based cascade classifier is used for face detection. The object tracking algorithm is used for continuous eye tracking. To identify the driver's drowsiness, the PERCLOS algorithm was extracted [2]. The paper focuses on building a non-disruptive system that can detect fatigue and issue timely warnings. The system will monitor drivers' eyes using a camera. By performing an algorithm, signs of driver fatigue can be detected early to avoid an accident.

3.Proposed System

In this phase we are going to elaborate our system. i.e, driver laziness detection system with the help of flowchart.

*Face Detection

The structural dimension is one of the most vital facial features.

We presented the symmetry of it in a one directional way with equal size of width of the image which gives us the value related with the vertical axis of symmetry of image. The old method to calculate the signal of symmetry for two white pictures while lies on the same line, we have increased the value in the medium between two pictures in vector. We have also improved the calculation of algorithm of symmetry into image which will accept it for face detection, by applying the presented rules over it. Rather than computing the symmetry among two pixels in picture, it is calculated between two windows. We have also given checking on two axes: Position difference of face detection according to time i.e, in many images, it may happen that difference of position detected face is limited.

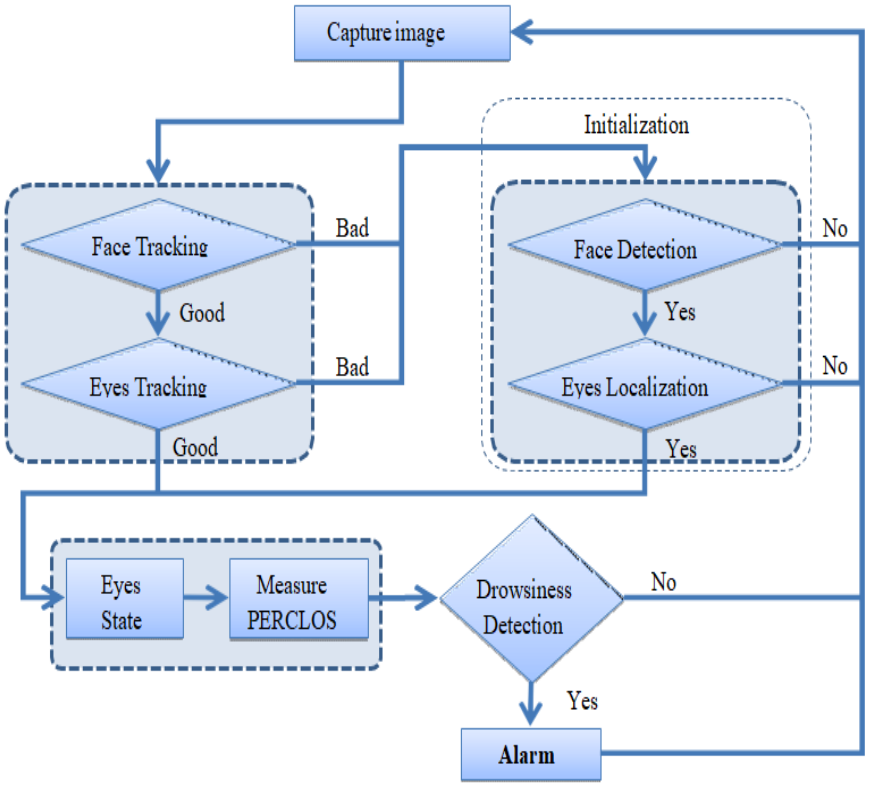


Figure 1 : Flowchart of the proposed system.

***EYE LOCALIZATION**

As we know that eyes are always defined area in the face, we have confined our research in the area between mouth and forehead. We are assured from the symmetrical characteristic of eyes to find them in the face. At the beginning , we move vertically the eROI by rectangular mark with calculated height of eye and face and then we calculate symmetry. The eye region has high measurement of symmetry. Then again we calculate the left and right sides. The peak value is related with the Centre of the eyes.

*TRACKING

We took the help of template matching for tracking purpose with the help of SAD Algorithm (sum of Absolute Differences).

$$SAD(a, b)= \sum_{J=1}^{N} \sum_{i=1}^{M} |I(a+i , b+j) – M(i , j)) \quad (1)$$

We tried to make regular update of reference model M to comfort it every time when light condition may not be good while driving, by developing a tracking test.

$$\text{Tracking } \{ \begin{array}{ll} \text{good} & \text{if SAD} \leq \text{Th} \\ \text{bad} & \text{if SAD} > \text{Th} \end{array} \quad (2)$$

*EYE_STATES

Here we classified eye state into two categories, Open and close.

We took the help of HTC (Hough transform of circle), to detect iris. Under this we have applied HTC, on the eye to find the circle with defined says, at the end we take the peak value in accumulator of Hough for all the rays.

Then we apply the logical ‘AND’ logic between edge picture and hence circle is obtained by HTC by measuring the interaction level between ‘S’.

State eye={open if $S \geq Th$

Close if $S < Th$

*How the Algorithm Works ?

Our system begins with initial phase, under which face and eye detection both takes place, and take them as a template to track them in the frames. For each tracking is good or bad ? if we find tracking is not up to mark i.e bad then we return to intial stage, Otherwise we pass as discussed above.

CONCLUSION

Fully meets the objectives and requirements of the program. The framework has achieved a stable state in which all distractions have been discarded. The alert clients are familiar with the framework and understand the focus points and the fact that it cares about the issue of stress for people with fatigue related problems to inform them of the level of sleepiness while driving. This review paper explains the different ways in which getting driver's sleep by analyzing facial expressions captured by the camera. This program includes two steps first to see the eye and then to see sleepy eyes. Eye detection done by how to process an image. In the second step we talk various acquisition methods, various movements of body etc. Lack of proper light after sunset can cause problems with image reading. The system detects it he driver's eye wearing glasses.

FUTURE SCOPE

This review paper explains the different ways in which getting driver's sleep by analyzing facial expressions captured by the camera. This program includes two steps first to see the eye and then to see sleepy eyes. Eye detection done by how to process an image. In the second step we talk various acquisition methods, various movements of body etc. Lack of proper light after sunset can cause problems with image reading. The system detects the driver's eye wearing glasses.

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