**A**

**Minor Project Report**

**On**

**Drowsiness Detection System**

*In partial fulfillment of the requirement for the award of the degree of*



**SUBMITTED BY**

**Ankit Lohia(0901IT181008)**

**Abhay Shakya(0901IT181001)**

**Anushka Pateriya(0901IT181011)**

**SUBMITTED TO**

**Prof. Rajeev Kumar Singh**

**Prof. Shweta Patel**

**Department of Information Technology**

#### Madhav Institute of Technology and Science, Gwalior

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

**Session: 2020-21**

|  |  |
| --- | --- |
| C:\Users\100RABH\Desktop\mitsmono.jpg | **Madhav Institute of Technology and Science, Gwalior (M.P.)** |
| (A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal) |
|  | |

# I hereby declare that the Project entitled “Drowsiness Detection System”

# which is being submitted in the partial fulfilment of the requirement for the award

# of Bachelor of Technology in Information Technology.

All information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I have fully cited and referenced all material and results that are not original to this work.

To the best of my knowledge the material presented in this Project has not been submitted elsewhere for the award of any other degree/diploma.

**Date:** Ankit Lohia (0901IT181008)

Abhay Shakya (0901IT181001)

Anushka Pateriya(0901IT181011)

##### CERTIFICATE

Certified that the work contained in the project titled **“**Drowsiness Detection System***”*,** by Ankit Lohia , Abhay Shakya and Anushka Pateriya has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

Prof. Supervisor Name: Prof Rajeev K. Singh and Prof. Shweta Patel

Dept. Name: Dept. of CSE and IT

MITS, GWALIOR

##### Acknowledgements

I would like to express my deepest appreciation to all those who provided me the possibility and played crucial role in completing this project. And provides best guidance and keep me motivated and invest their full effort in helping us. A special gratitude I give to our minor project supervisor Prof. Rajeev Kumar Singh and Prof. Shweta Patel, whose contribution in stimulating suggestions and encouragement, helped us to coordinate in our project.

Ankit Lohia

Abhay Shakya

Anushka Pateriya

**CONTENTS**

## Introduction

## Introduction

## Problem Statement

## Overview

## System Requirement

## System Analysis and Design

## Implementation

## Conclusion and Future Scope

## References

* **INTRODUCTION**

The objective of this project is to build a drowsiness detection system that will detect that a person’s eyes are closed for a few seconds. This system will alert the user on reaching a certain saturation point of the drowsiness measure.

**PROBLEM STATEMENT**

The majority of accidents happen due to the drowsiness of

the driver. This project proposes a method to detect drowsiness by

using video or webcam. It analyses the video images that have been

recorded and come up with a system that can analyse each frame of

the video.  We will build a system using Python, OpenCV, and Keras

which will alert the driver when he feels sleepy.

**OVERVIEW**

* Taking image as input from a camera.
* Detecting the face in the image and create a Region of Interest (ROI).
* Detecting the eyes from ROI and feed it to the classifier.
* Classifier will categorize whether eyes are open or closed.
* Calculate score to check whether the person is drowsy.

**SYSTEM REQUIREMENTS**

#### Software requirements:

1. Python 3: It is an interpreted, high-level and general- purpose programming language. Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

* **LIBRARIES**

1. 1 OpenCV: Open Source Computer Vision Library is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications.
   1. TensorFlow: It is an end-to-end open source platform for

machine learning. It has a comprehensive, flexible ecosystem of

tools, libraries and community resources that lets researchers push

the state-of-the-art in ML and developers easily build and deploy ML

powered applications.

* 1. Keras: It is a high-level library that’s built on top of Theano

or TensorFlow. It provides a scikit-learn type API (written in

Python) for building Neural Networks. Developers can use Keras to

quickly build neural networks without worrying about the

mathematical aspects of tensor algebra, numerical techniques, and

optimization methods.

* 1. Pygame: It is a cross-platform set of Python modules which

used to create video games. It consists of computer graphics and

sound libraries designed to be used with the Python programming

language. Pygame was officially written by **Pete Shinners** to replace

PySDL. Pygame is suitable to create client-side applications that can

be potentially wrapped in a standalone executable.

#### Hardware requirements:

Laptop with basic hardware and webcam

### System Analysis And Design:

### Implementation:

In our program we used Dlib, a pre-trained program trained on the

* In our program we used Dlib a pre-trained program trained

on the HELEN dataset to detect human faces using the pre-

defined 68 landmarks.

After passing our video feed to the dlib frame by frame, we are able to

* After passing our video feed to the dlib frame by frame, we

are able to detect left eye and right eye features of the face.

* Now, we drew contours around it using OpenCV.
* Using Scipy’s Euclidean function, we calculated sum of both

eyes’ aspect ratio which is the sum of 2 distinct vertical distances

between the eyelids divided by its horizontal distance.

* Now we check if the aspect ratio value is less than 0.25 (0.25

was chosen as a base case after some tests). If it is less an

alarm is sounded and user is warned.

• In our program we used Dlib, a pre-trained program trained on the

### CONCLUSION AND FUTURE SCOPE:

It completely meets the objectives and requirements of the system.

It takes care of the issue of stressing out for individuals having

fatigue-related issues to inform them about the drowsiness level

while driving.

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.

Sensors can be added to track the heart rate in order to prevent

accidents caused due to sudden heart attacks to drivers.

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.

### REFERENCES

### <https://data-flair.training>

http://www.jotr.in/text.asp?2013/6/1/1/118718

<http://dlib.net/face_landmark_detection_ex.cpp.html>

[https://stackoverflow.com](https://stackoverflow.com/)

<https://github.com/>

https://www.geeksforgeeks.org/

### 