ANTI-SLEEP ALARM FOR DRIVERS (BASED ON AI) (INCLUDES AUTOMATIC BRAKING AND INDICATION SYSTEM)

An Engineering Project in Community Service

Phase – II Report

Submitted by

- 19BCY10055 – ADITI SRIVASTAVA
- 19MIM10002 – ANIMESH MAHAJAN
- 19MIM10117 – SWAMY ABHISHEK SHIVANAND
- 19MIM10021 – AYUSH DAS
- 19MIM10102 – TUSHAR SUNIL RASURE
- 19BOE10084 – BILAL MANSOORI
- 19BOE10040 – SHIKHAR PRIYANI

in partial fulfillment of the requirements for the degree of

Bachelor of Engineering and Technology

VIT Bhopal University

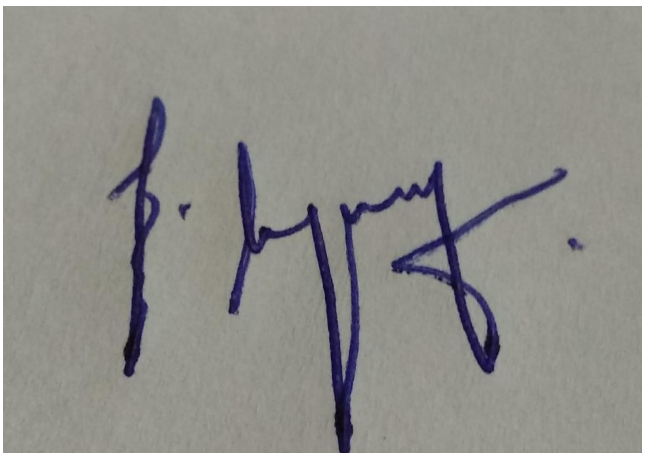
Bhopal, Madhya Pradesh

APRIL-2022

Bonafide Certificate

Certified that this project report titled **"Anti-sleep Alarm for drivers (BASED ON AI) (includes automatic braking and indication system)"** is the bonafide work of "ADITI SRIVASTAVA – 19BCY10055, ANIMESH MAHAJAN–19MIM10002, SWAMY ABHISHEK SHIVANAND- 19MIM10117, SHIKHAR PRIYANI–19BOE10040, TUSHAR SUNIL RASURE–19MIM10102, AYUSH DAS–19MIM10021, BILAL MANSOORI – 19BOE10084" who carried out the project work under my supervision.

This project report (Phase II) is submitted for the Project Viva-Voce examination held on 23-April-2022.



Supervisor

Acknowledgement

We would like to acknowledge all whose guidance and encouragement that has made me to do what is done so far, I avail the opportunity to express my deep sense of gratitude and sincere thanks to our schools (SEEE, SCSE, SMEC)

We express our sincere gratitude to Dr. G. Viswanathan, Honorable Chancellor, VIT University, Bhopal for providing us the facilities.

We are thankful to Dr. U. Kamachi Mudali,, Vice Chancellor, IT University, Bhopal for their support and encouragement.

We take this opportunity to express my heart full thanks to my guides Dr. Soumya Shankar Ghosh sir and Dr Nella Anveshkumar sir whose encouragement and best wishes provided impetus for this project.

We also thank our friends for their valuable suggestions. We are thankful to them for their co- operation for the successful completion of this project.

Last but not the least We also thank our parents for being supportive in all our activities and careers without whom it wouldn’t be possible for us to reach successful completion of this project.

TABLE OF CONTENTS

1. INTRODUCTION

In this fast-moving world, we still depend on human drivers to drive truckloads that lead to risky factors such as deteriorating infrastructure, weather, driver shortage and finally drowsy driving. Drowsy driving is defined as driving a vehicle when unable to stay alert owing to a lack of sleep. Sleep deprived driving, fatigued driving, and weary driving are all terms used to describe drowsy driving. When driving in this state, response time and stimulus judgment are slowed and impaired.This drowsy driving has been the main cause of motor vehicle accidents. Drowsy driving is the danger of all other risk factors, owing to the fact that it is unsafe for both us as well as the travelers who accompany us on the road. So, our project comes up with a solution for drowsy driving and eliminates the accidents caused due to this risk factor. Our project's theme is, simple to install onto the vehicle and a most effective way to overcome the problem. This led us to come up with an AI based sleep detection system. It detects drowsiness and gives out a voice output to wake the driver up also if the driver didn't respond to the voice, then comes the backup way of bringing up an alarm and at the end break is applied gradually. This decreases accidents and loss of life on the road.

1.1 Motivation

Our main motive was to prevent road traffic crashes related to driver drowsiness or inattentiveness.The majority of road traffic fatalities and injuries occur in low- and middle-income countries. India accounts for more than 10% of global road traffic casualties, with 148,000 fatalities in 2017. A truck is involved in one-fourth of deadly incidents on Indian highways, which is concerning. It's no surprise that a significant number of road crashes are caused by driver fatigue and inattentiveness in a country where most truck drivers drive for 14–15 hours without stopping. Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians.Official documents published by the Ministry of Road Transport and Highways ("Road Accidents in India", 2015)show that 2,270 people were killed in 8,359 accidents in one year due to "driver inattention".According to the director general of the World Health Organization, most road accidents are not "accidents". They are preventable.Therefore, safety is a key element in the development of Daimler Trucks and Buses vehicles on the road to avoid accidents. Unfortunately, the majority of fatal road traffic collisions are caused by human mistake.Attention to the human factor and not only to vehicle safety has therefore become a priority in the development efforts of our engineer.

1.2 Objective

Objective The project objective is to detect the drowsiness is to detect the face of the driver and when detected, the eyes of the people are captured and passed to another module called "eyegame", which then processes the captured video image and detects eye movement. If the eye of the driver remains at the same position without any movement or blinking or no eyeball detected then a voice output will be triggered along with indication (back lights), asking the driver to stay awake, if driver didn't wake up an alarm will be raised and eventually slow breaking is

1.2.1 Brief History of The Work:

This project began with the research of the proposed title. The result of that research is discussed with the supervisor. Once the project was approved, the background of study for this project was explored. Raspberry pi was chosen. After all being settled, the construction of the hardware part was started after the components were being chosen. In all the steps done there are troubleshooting parts to resolve the problems facing. Between hardware part and instruction programmed built, there is an integrated step that allows the pi to simulate all the operations of the system. After all the parts are complete to build, some analysis should be made to show what the solution of the problems occurred

2. Existing Work / Literature Review

2.1 Existing Projects

- Bharat Benz - Driver state monitoring system (DSMS) is a system based on a camera to monitor driver alertness, that not only recognizes the driver, but also checks his level of vigilance. Because the level of drowsiness is measured approximately every 5 min, sudden variations cannot be detected using subjective measures.Another disadvantage of subjective assessments is that self-introspection alerts the driver, lessening their level of tiredness.
- The purpose of the Driver Monitoring system is to alert the driver when signs of drowsiness or distraction are detected. This is not available for everyone's use yet in India.
- As far as the costing is concerned, this is only provided in their high-end models that too as an add-on.

2.2 Literature Review

➢ SYSTEM REVIEW

This survey is being conducted to better understand the needs and requirements of the general public, and in order to do so, we combed through several websites and applications for the necessary information. We created an audit based on this data, which allowed us to generate fresh ideas and build alternate arrangements for our assignment. We reached the decision that there is a need for such an application and felt that there is a decent extent of progress in this field too.

➢ TECHNOLOGY USED

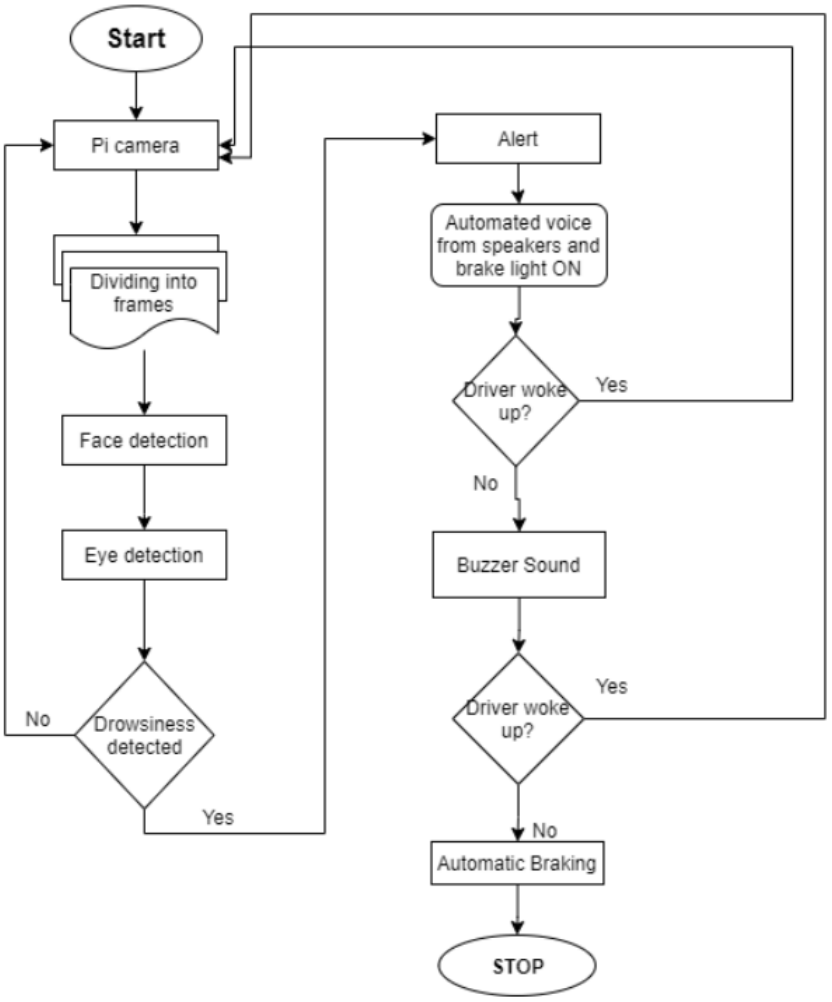
A. **PYTHON** - Python is an interpreted, high level, widely used programming language. Python's plan reasoning stresses code clarity with its remarkable utilization of huge whitespace. Its language constructs and object-oriented approach assist software engineers with composing clear, consistent code for little and huge scope projects. Python is powerfully composed AND upholds different programming ideal models, including procedural, object-situated, and practical programming.

B. **IMAGE PROCESSING -** In computer science, computerized picture handling is the utilization of computer algorithms to perform image processing on advanced pictures.

C. **MACHINE LEARNING** - Machine learning is the logical investigation of calculations and measurable models that PC frameworks use to play out a particular assignment actually without utilizing express guidelines, depending on examples and surmising all things being equal.. It is seen as a subset of artificial intelligence. Machine learning algorithms fabricate a numerical model in light of test information, known as "preparing information", to settle on expectations or choices without being expressly told.

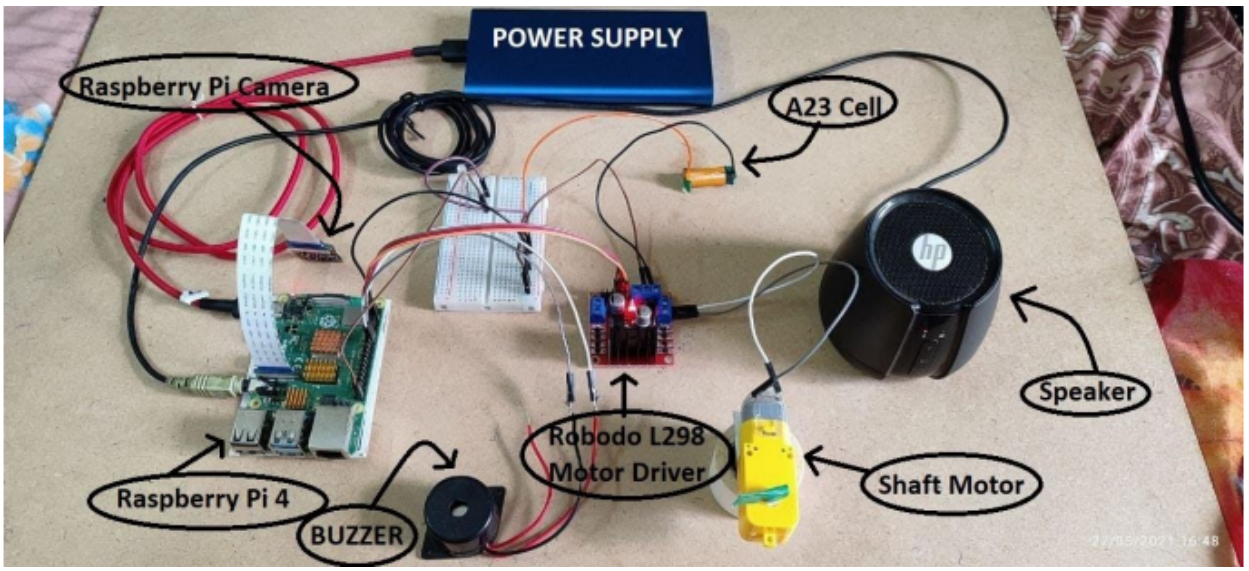
3. Topic of the work

a) System Design / Architecture



Components:

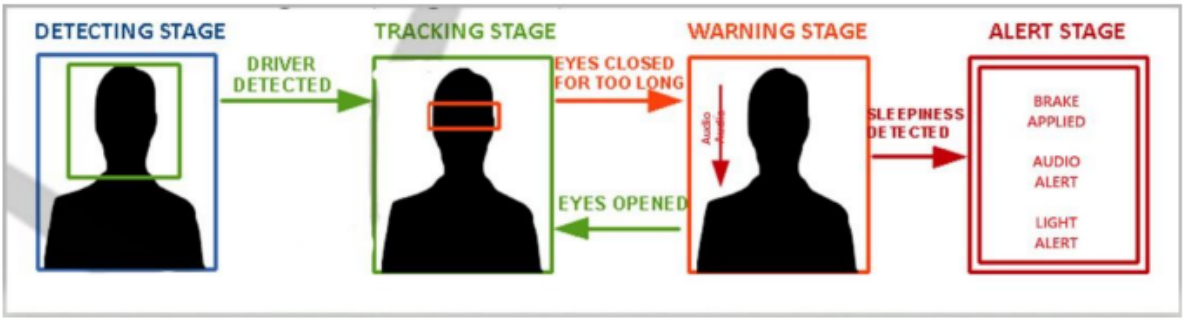
- Raspberry pi 4
- Raspberry Pi NoIR Camera
- Robodo L298 Motor Driver Module
- Passive Speaker Buzzer Module
- DC BO Motor Dual Shaft



b) Working Principle

The system conveyed in the project mainly constitutes of three phases of working:

- Detection of drowsiness
- Voice Alert and Alarm
- Subsequent braking



- An IR camera is mounted on the dashboard of the vehicle and is used to monitor the driver continuously. This monitoring is done by the Raspberry Pi computer, which is programmed to turn on a voice alert to the driver upon any signs of sleepiness, for example: “Are you sleeping, please respond or else the vehicle will be put on to emergency stopping mode”. If the driver gets back to form and turns-off the alert, it will terminate. If not, the vehicle will turn on heavy alarms and stop the vehicle as smooth as possible along with indicating the surrounding drivers about the emergency stop such that they can drive aside precautionarily

CODE:

```
import face_recognition
import cv2
import numpy as np
import time
from espeak import espeak
import cv2
import RPi.GPIO as GPIO
from time import sleep
from gpiozero import Buzzer
import eye_game
in1 = 3
in2 = 4
en = 2
buzzer = Buzzer(23)
led = 21
GPIO.setup(led,GPIO.OUT)
GPIO.setmode(GPIO.BCM)
GPIO.setup(in1,GPIO.OUT)
GPIO.setup(in2,GPIO.OUT)
GPIO.setup(en,GPIO.OUT)
GPIO.output(in1,GPIO.LOW)
GPIO.output(in2,GPIO.LOW)
p=GPIO.PWM(en,1000)
p.start(100)


previous ="unkno"
count=0
video_capture = cv2.VideoCapture(0)
#frame = (video_capture, file)
file = 'image_data/image.jpg'
# Load a sample picture and learn how to recognize it.
cha_image = face_recognition.load_image_file("cha.jpg")
```

```
cha_face_encoding = face_recognition.face_encodings(cha_image)[0]

# Create arrays of known face encodings and their names
known_face_encodings = [
 cha_face_encoding
]
known_face_names = [
 "     "
]
# Initialize some variables
face_locations = []
face_encodings = []
face_names = []
process_this_frame = True
temp_count = -1
GPIO.output(in1,GPIO.HIGH)
GPIO.output(in2,GPIO.LOW)
print("Engine running")
while(True):
 # Grab a single frame of video
  ret, frame = video_capture.read()
  # Resize frame of video to 1/4 size for faster face recognition processing
 small_frame = cv2.resize(frame, (0, 0), fx=0.25, fy=0.25)

 # Convert the image from BGR color (which OpenCV uses) to RGB color (which
face_recognition uses)
 rgb_small_frame = small_frame[:, :, ::-1]
 # Only process every other frame of video to save time
 if process_this_frame:
 # Find all the faces and face encodings in the current frame of video
 face_locations = face_recognition.face_locations(rgb_small_frame)
 face_encodings = face_recognition.face_encodings(rgb_small_frame, face_locations)
 cv2.imwrite(file, small_frame)
 face_names = []
```

```
for face_encoding in face_encodings:
# See if the face is a match for the known face(s)
matches = face_recognition.compare_faces(known_face_encodings, face_encoding)
name = "Unknown"
 # # If a match was found in known_face_encodings, just use the first one.
# if True in matches:
# first_match_index = matches.index(True)
# name = known_face_names[first_match_index]
# Or instead, use the known face with the smallest distance to the new face
face_distances = face_recognition.face_distance(known_face_encodings, face_encoding)
best_match_index = np.argmin(face_distances)
if matches[best_match_index]:
name = known_face_names[best_match_index]
 direction= eye_game.get_eyeball_direction(file)
print(direction)
#eye_game.api.get_eyeball_direction(cv_image_array)
if previous != direction:
previous=direction
 else:
print("old same")
count=1+count
print(count)
if (count>=30):
if(temp_count <= 15):
espeak.synth("Driver entering unconscious mode")
#led on
GPIO.output(led, GPIO.HIGH)
temp_count += 1
else:
# Buzzer.....................
tt = 0
while(tt <= 8):
buzzer.beep()
tt += 1
```

```
buzzer.on()
sleep(10)
# Motor stop.....
buzzer.off()
GPIO.output(in1, GPIO.LOW)
GPIO.output(in2, GPIO.LOW)
break
else:
espeak.synth(" ")
 face_names.append(name)
 process_this_frame = not process_this_frame
# Display the results
for (top, right, bottom, left), name in zip(face_locations, face_names):
# Scale back up face locations since the frame we detected in was scaled to 1/4 size
top *= 4
right *= 4
bottom *= 4
left *= 4
# Draw a box around the face
cv2.rectangle(frame, (left, top), (right, bottom), (0, 0, 255), 2)

# Draw a label with a name below the face
cv2.rectangle(frame, (left, bottom - 35), (right, bottom), (0, 0, 255), cv2.FILLED)
font = cv2.FONT_HERSHEY_DUPLEX
cv2.putText(frame, name, (left + 6, bottom - 6), font, 1.0, (255, 255, 255), 1)
#cv2 putText(frame, frame_string, (left + 10, top - 10), font, 1.0, (255, 255, 255), 1)
# Display the resulting image
cv2.imshow('Video', frame)
# Hit 'q' on the keyboard to quit!
if cv2.waitKey(1) & 0xFF == ord('q'):
break
# Release handle to the webcam
video_capture.release()
cv2.destroyAllWindows()
```

c) RESULTS

- When the driver is feeling drowsy, we will be detecting it and voice output will be given, saying “Driver you’re sleepy” and a light indication will be turned on.
- Eventually, an alarm will be raised and slow braking will be applied.
- The price of this setup is quite affordable for a common man.
- And, this setup has very simple installation methods.
- Working Video:

d) INDIVIDUAL CONTRIBUTION

1. ABHISHEK SWAMI

He has a good history of experience in using Python and ML. For him, working on the Raspberry Pi was a new experience. He used his knowledge and searched the internet for other possible tactics. He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. Using Python and ML libraries, he made well-integrated software and hardware. He performed the necessary testing on the whole system, in different situations (i.e., low light, blur vision, etc.).

2. ANIMESH MAHAJAN

He has a good history of experience in using IOT devices and automation. He had used other IOT devices and components for other projects. His main contribution was in testing and debugging the code, to make it run as smooth as possible and optimize it. He got over it by brainstorming using his knowledge and searching the internet for solutions of the errors. He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. Using Python and ML libraries, he made well integrated software and hardware. He performed the necessary testing on the whole system, in different situations (i.e., low light, blur vision, etc.)

3. ADITI SRIVASTAVA

She has a pretty good experience in using the Raspberry Pi 4 computer, from her previous projects. This helped us in easily installing and setting up the OS. She identified the real-life problem and did research on the compatible hardware modules. She also helped in finalizing the electrical components needed for the hardware implementation. She connected the different components and IC modules to make the system work as it has to. Using Python and ML libraries, he made well-integrated software and hardware. She performed the necessary testing on the whole system, in different situations (i.e., low light, blur vision, etc.).

4. **AYUSH DAS**

He has experience of working with other IOT technologies and Python programming language. He helped us finalize the required and required/useful Python libraries. Choosing the best libraries was a task because some functions weren't supported in all libraries. We had to choose the most optimized libraries and he gave us the best available ones. He identified the real-life problem and did research on the software and libraries. He identified the real-life problem and did research on the compatible hardware modules.

5. **BILAL MANSOORI**

His knowledge on car's hardware and software helped us know how the different things in a car/vehicle are linked and work together. This led us towards a clearer view towards our idea and implementation. He designed the whole braking system of the car for our project, including mechanism, hardware required and other essentials.He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. He got good knowledge on the IOT technology and ML

6. **TUSHAR RASURE**

He has a pretty good experience in using the Raspberry Pi 4 computer, from his previous projects. He knows different electronic parts and this helped in choosing the best hardware, like Raspberry Pi, Robodo driver module, etc. This helped us in easily installing and setting up the OS. He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. He got good knowledge on the IOT technology and ML

7. **SHIKHAR PRIYANI**

He has experience of working with other IOT technologies and Python programming language. He helped us finalize the required and required/useful Python libraries. Choosing the best libraries was a task because some functions weren't supported in all libraries. We had to choose the most optimized libraries and he gave us the best available ones. He identified the real-life problem and did research on the software and libraries. He identified the real-life problem and did research on the compatible hardware modules.

4. CONCLUSION

In this project, A real time vision-based sleep detection anti sleep alarm was proposed. The driver normality monitoring system developed is capable of detecting drowsiness behaviors of drivers in a short time.The Drowsiness Detection System, which is based on the driver's eye closure, can distinguish between normal eye blink and drowsiness, as well as identify drowsiness while driving. The proposed system can help prevent accidents caused by drowsy driving. Even if the driver wears glasses, the device functions effectively in low light settings if the camera produces a higher output. Various self-developed image processing methods are used to collect information about the head and eye positions. The technology can determine if the eyes are open or closed during the monitoring. A warning signal is given when the eyes are closed for an extended period of time. Continuous eye closures are used to determine the driver's alertness state.

5. Reference

- Froba, B., and Ernst, A. Face detection with the modified census transform. In IEEE International Conference on Automatic Face and Gesture Recognition, (2004), 91-96

- Jibo He, William Choi, Yan Yang, Junshi Lu, Xiaohui Wu, Kaiping Peng(2017) Detection of driver drowsiness using wearable devices: A feasibility study of the proximity sensor.February 2017 Applied Ergonomics.

- Jose Solaz, Jose Laparra-Hernandez, Daniel Bande, Noelia Rodriguez, Sergio Veleff, Jose Gerpe, Enrique Medina. (2016) Drowsiness detection based on the analysis of breathing rate obtained from real time image recognition, 6th transport Research Arena April 18-21, 2016.

- Viola, P., and Jones, M. Rapid object detection using a boosted cascade of simple features. In IEEE Computer Society Conference on Computer Vision and Pattern Recognition, (2001),I-511-I-518 vol. 511.

6. Plagiarism Report:

Check Plagiarism

Don`t Worry! This report is 100% safe & secure. It`s not available publically and it`s not accessible by search engines (Google, Yahoo. Bing, etc)

Sentence

INTRODUCTIONIn this fast-moving world, we still depend on human drivers to drive truckloads that lead to risky factors such as deteriorating infrastructure, weather, driver shortage and finally drowsy driving. Drowsy driving is defined as driving a vehicle when unable to stay alert owing to a lack of sleep. Sleep deprived driving, fatigued driving, and weary driving are all terms used to describe drowsy driving. When driving in this state, response time and stimulus judgment are slowed and impaired.This drowsy driving has been the main cause of motor vehicle accidents. Drowsy driving is the danger of all other risk factors, owing to the fact that it is unsafe for both us as well as the travelers who accompany us on the road. So, our project comes up with a solution for drowsy driving and eliminates the accidents caused due to this risk factor. Our project's theme is, simple to install onto the vehicle and a most effective way to overcome the problem. This led us to come up with an AI based sleep detection system. It detects drowsiness and gives out a voice output to wake the driver up also if the driver didn't respond to the voice, then comes the backup way of bringing up an alarm and at the end break is applied gradually. This decreases accidents and loss of life on the road. 1.1 Motivation:Our main motive was to prevent road traffic crashes related to driver drowsiness or inattentiveness.The majority of road traffic fatalities and injuries occur in low- and middle-income countries. India accounts for more than 10% of global road traffic casualties, with 148,000 fatalities in 2017. A truck is involved in one-fourth of deadly incidents on Indian highways, which is concerning. It's no surprise that a significant number of road crashes are caused by driver fatigue and inattentiveness in a country where most truck drivers drive for 14–15 hours without stopping. Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians.Official documents published by the Ministry of Road Transport and Highways ("Road Accidents in India", 2015)show that 2,270 people were killed in 8,359 accidents in one year due to "driver inattention".According to the director general of the World Health Organization, most road accidents are not "accidents". They are preventable.Therefore, safety is a key element in the development of Daimler Trucks and Buses vehicles on the road to avoid accidents. Unfortunately, the majority of fatal road traffic collisions are caused by human mistake.Attention to the human factor and not only to vehicle safety has therefore become a priority in the development efforts of our engineer. 1.2 Objective The project objective is to detect the drowsiness is to detect the face of the driver and when detected, the eyes of the people are captured and passed to another module called "eyegame", which then processes the captured video image and detects eye movement. If the eye of the driver remains at the same position without any movement or blinking or no eyeball detected then a voice output will be triggered along with indication (back lights), asking the driver to stay awake, if driver didn't wake up an alarm will be raised and eventually slow breaking is 1.2.1 Brief History of The Work:This project began with the research of the proposed title. The result of that research is discussed with the supervisor. Once the project was approved, the background of study for this project was explored. Raspberry pi was chosen. After all being settled, the construction of the hardware part was started after the components were being chosen. In all the steps done there are troubleshooting parts to resolve the problems facing. Between hardware part and instruction programmed built, there is an integrated step that allows the pi to simulate all the operations of the system. After all the parts are complete to build, some analysis should be made to show what the solution of the problems occurred 2. Existing Work / Literature Review 2.1 Existing Projects Bharat Benz - Driver state monitoring system (DSMS) is a system based on a camera to monitor driver alertness, that not only recognizes the driver, but also checks his level of vigilance. Because the level of drowsiness is measured approximately every 5 min, sudden variations cannot be detected using subjective measures.Another disadvantage of subjective assessments is that self-introspection alerts the driver, lessening their level of tiredness. The purpose of the Driver Monitoring system is to alert the driver when signs of drowsiness or distraction are detected. This is not available for everyone's use yet in India. As far as the costing is concerned, this is only provided in their high-end models that too as an add-on. 2.2 Literature Review SYSTEM REVIEW This survey is being conducted to better understand the needs and requirements of the general public, and in order to do so, we combed through several websites and applications for the necessary information. We created an audit based on this data, which allowed us generate fresh ideas and build alternate arrangements for our assignment. We reached the decision that there is a need for such an application and felt that there is a decent extent of progress in this field too. TECHNOLOGY USED PYTHON - Python is an interpreted, high level, widely used programming language. Python's plan reasoning stresses code clarity with its remarkable utilization of huge whitespace. Its language constructs and object-oriented approach assist software engineers with composing clear, consistent code for little and huge scope projects. Python is powerfully composed AND upholds different programming ideal models, including procedural, object-situated, and practical programming. IMAGE PROCESSING - In computer science, computerized picture handling is the utilization of computer algorithms to perform image processing on advanced pictures. MACHINE

LEARNING - Machine learning is the logical investigation of calculations and measurable models that PC frameworks use to play out a particular assignment actually without utilizing express guidelines, depending on examples and surmising all things being equal.. It is seen as a subset of artificial intelligence. Machine learning algorithms fabricate a numerical model in light of test information, known as "preparing information", to settle on expectations or choices without being expressly told. An IR camera is mounted on the dashboard of the vehicle and is used to monitor the driver continuously. This monitoring is done by the Raspberry Pi computer, which is programmed to turn on a voice alert to the driver upon any signs of sleepiness, for example: “Are you sleeping, please respond or else the vehicle will be put on to emergency stopping mode”. If the driver gets back to form and turns-off the alert, it will terminate. If not, the vehicle will turn on heavy alarms and stop the vehicle as smooth as possible along with indicating the surrounding drivers about the emergency stop such that they can drive aside precautionarily d) INDIVIDUAL CONTRIBUTION ABHISHEK SWAMI He has a good history of experience in using Python and ML. For him, working on the Raspberry Pi was a new experience. He used his knowledge and searched the internet for other possible tactics. He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. Using Python and ML libraries, he made well-integrated software and hardware. He performed the necessary testing on the whole system, in different situations (i.e., low light, blur vision, etc.). ANIMESH MAHAJAN He has a good history of experience in using IOT devices and automation. He had used other IOT devices and components for other projects. His main contribution was in testing and debugging the code, to make it run as smooth as possible and optimize it. He got over it by brainstorming using his knowledge and searching the internet for solutions of the errors. He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. Using Python and ML libraries, he made well integrated software and hardware. He performed the necessary testing on the whole system, in different situations (i.e., low light, blur vision, etc.) ADITI SRIVASTAVA She has a pretty good experience in using the Raspberry Pi 4 computer, from her previous projects. This helped us in easily installing and setting up the OS. She identified the real-life problem and did research on the compatible hardware modules. She also helped in finalizing the electrical components needed for the hardware implementation. She connected the different components and IC modules to make the system work as it has to. Using Python and ML libraries, he made well-integrated software and hardware. She performed the necessary testing on the whole system, in different situations (i.e., low light, blur vision, etc.). AYUSH DAS He has experience of working with other IOT technologies and Python programming language. He helped us finalize the required and required/useful Python libraries. Choosing the best libraries was a task because some functions weren’t supported in all libraries. We had to choose the most optimized libraries and he gave us the best available ones. He identified the real-life problem and did research on the software and libraries. He identified the real-life problem and did research on the compatible hardware modules. BILAL MANSOORI His knowledge on car’s hardware and software helped us know how the different things in a car/vehicle are linked and work together. This led us towards a clearer view towards our idea and implementation. He designed the whole braking system of the car for our project, including mechanism, hardware required and other essentials.He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. He got good knowledge on the IOT technology and ML TUSHAR RASURE He has a pretty good experience in using the Raspberry Pi 4 computer, from his previous projects. He knows different electronic parts and this helped in choosing the best hardware, like Raspberry Pi, Robodo driver module, etc. This helped us in easily installing and setting up the OS. He identified the real-life problem and did research on the compatible hardware modules. He also helped in finalizing the electrical components needed for the hardware implementation. He got good knowledge on the IOT technology and ML SHIKHAR PRIYANI He has experience of working with other IOT technologies and Python programming language. He helped us finalize the required and required/useful Python libraries. Choosing the best libraries was a task because some functions weren’t supported in all libraries. We had to choose the most optimized libraries and he gave us the best available ones. He identified the real-life problem and did research on the software and libraries. He identified the real-life problem and did research on the compatible hardware modules 4. CONCLUSION In this project, A real time vision-based sleep detection anti sleep alarm was proposed. The driver normality monitoring system developed is capable of detecting drowsiness behaviors of drivers in a short time.The Drowsiness Detection System, which is based on the driver's eye closure, can distinguish between normal eye blink and drowsiness, as well as identify drowsiness while driving. The proposed system can help prevent accidents caused by drowsy driving. Even if the driver wears glasses, the device functions effectively in low light settings if the camera produces a higher output. Various self-developed image processing methods are used to collect information about the head and eye positions. The technology can determine if the eyes are open or closed during the monitoring. A warning signal is given when the eyes are closed for an extended period of time. Continuous eye closures are used to determine the driver's alertness state.

Total Words:	1930
Total Characters:	12358
Keywords/Total Words Ratio:	0%
Excluded URL:	No
Unique:	**91%**
Matched:	**9%**

Sentence wise detail:

INTRODUCTIONIn this fast-moving world, we still depend on human drivers to drive truckloads that lead

to risky factors such as deteriorating infrastructure, weather, driver shortage and finally drowsy driving.

Drowsy driving is defined as driving a vehicle when unable to stay alert owing to a lack of sleep.

Sleep deprived driving, fatigued driving, and weary driving are all terms used to describe drowsy driving.

When driving in this state, response time and stimulus judgment are slowed and impaired.

This drowsy driving has been the main cause of motor vehicle accidents.

Drowsy driving is the danger of all other risk factors, owing to the fact that it is unsafe for both us as well as the travelers who accompany us on the road.

So, our project comes up with a solution for drowsy driving and eliminates the accidents caused due to this risk factor.

Our project's theme is, simple to install onto the vehicle and a most effective way to overcome the problem.

This led us to come up with an AI based sleep detection system.

It detects drowsiness and gives out a voice output to wake the driver up also if the driver didn't respond

to the voice, then comes the backup way of bringing up an alarm and at the end break is applied gradually.

This decreases accidents and loss of life on the road. 1.

1 Motivation:Our main motive was to prevent road traffic crashes related to driver drowsiness or inattentiveness.

The majority of road traffic fatalities and injuries occur in low- and middle-income countries.

India accounts for more than 10% of global road traffic casualties, with 148,000 fatalities in 2017.

A truck is involved in one-fourth of deadly incidents on Indian highways, which is concerning.

Its no surprise that a significant number of road crashes are caused by driver

fatigue and inattentiveness in a country where most truck drivers drive for 14–15 hours without stopping. (0)

Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians. Official documents published by the Ministry of Road Transport and Highways ("Road Accidents in (1)

Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians. India", 2015)show that 2,270 people were killed in 8,359 accidents in one year due to (2)

Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians. driver inattention". (3)

Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians. According to the director general of the World Health Organization, most road accidents are not "accidents". (4)

Distracted driving is particularly dangerous not only for drivers and passengers, but can also pose a serious risk to other motorists and pedestrians. They are preventable. (5)

Therefore, safety is a key element in the development of Daimler Trucks and Buses vehicles on the road to avoid accidents.

Unfortunately, the majority of fatal road traffic collisions are caused by human mistake.

Attention to the human factor and not only to vehicle safety has therefore become a priority in the development efforts of our engineer. 1.

2 Objective The project objective is to detect the drowsiness is to detect the face of the driver and when detected, the eyes

of the people are captured and passed to another module called eyegame", which then processes the captured video image and detects eye movement.

If the eye of the driver remains at the same position without any movement or blinking or

no eyeball detected then a voice output will be triggered along with indication (back lights), asking the driver

to stay awake, if driver didnt wake up an alarm will be raised and eventually slow breaking is

1.2.

1 Brief History of The Work:This project began with the research of the proposed title.

The result of that research is discussed with the supervisor.

Once the project was approved, the background of study for this project was explored.

Raspberry pi was chosen.

After all being settled, the construction of the hardware part was started after the components were being chosen.

In all the steps done there are troubleshooting parts to resolve the problems facing.

Between hardware part and instruction programmed built, there is an integrated step that allows the pi to simulate all the operations of the system.

After all the parts are complete to build, some analysis should be made to show what the solution of the problems occurred 2.

Existing Work / Literature Review 2.

1 Existing Projects Bharat Benz - Driver state monitoring system (DSMS) is a system based on a

camera to monitor driver alertness, that not only recognizes the driver, but also checks his level of vigilance. (6)

Because the level of drowsiness is measured approximately every 5 min, sudden variations cannot be detected using subjective measures.

Another disadvantage of subjective assessments is that self-introspection alerts the driver, lessening their level of tiredness.

The purpose of the Driver Monitoring system is to alert the driver when signs of drowsiness or distraction are detected.

This is not available for everyone's use yet in India.

As far as the costing is concerned, this is only provided in their high-end models that too as an add-on. 2.

2 Literature Review SYSTEM REVIEW This survey is being conducted to better understand the needs and requirements of the

general public, and in order to do so, we combed through several websites and applications for the necessary information.

We created an audit based on this data, which allowed us generate fresh ideas and build alternate arrangements for our assignment.

We reached the decision that there is a need for such an application and felt that there is a decent extent of progress in this field too.

TECHNOLOGY USED PYTHON - Python is an interpreted, high level, widely used programming language.

Python's plan reasoning stresses code clarity with its remarkable utilization of huge whitespace.

Its language constructs and object-oriented approach assist software engineers with composing clear, consistent code for little and huge scope projects.

Python is powerfully composed AND upholds different programming ideal models, including procedural, object-situated, and practical programming.

IMAGE PROCESSING - In computer science, computerized picture handling is the utilization of computer algorithms to perform image processing on advanced pictures. MACHINE LEARNING - Machine learning is the logical investigation of calculations and measurable models that PC frameworks use to (7)

play out a particular assignment actually without utilizing express guidelines, depending on examples and surmising all things being equal..

It is seen as a subset of artificial intelligence.

Machine learning algorithms fabricate a numerical model in light of test information, known as preparing information", to settle on expectations or choices without being expressly (8)

Machine learning algorithms fabricate a numerical model in light of test information, told. (9)

An IR camera is mounted on the dashboard of the vehicle and is used to monitor the driver continuously.

This monitoring is done by the Raspberry Pi computer, which is programmed to turn on a voice alert to the driver upon

any signs of sleepiness, for example: “Are you sleeping, please respond or else the vehicle will be put on to emergency stopping mode”.

If the driver gets back to form and turns-off the alert, it will terminate.

If not, the vehicle will turn on heavy alarms and stop the vehicle as smooth as

possible along with indicating the surrounding drivers about the emergency stop such that they can drive aside

precautionarily d) INDIVIDUAL CONTRIBUTION ABHISHEK SWAMI He has a good history of experience in using Python and ML. (10)

For him, working on the Raspberry Pi was a new experience.

He used his knowledge and searched the internet for other possible tactics.

He identified the real-life problem and did research on the compatible hardware modules.

He also helped in finalizing the electrical components needed for the hardware implementation.

Using Python and ML libraries, he made well-integrated software and hardware.

He performed the necessary testing on the whole system, in different situations (i. e. , low light, blur vision, etc.). (11)

ANIMESH MAHAJAN He has a good history of experience in using IOT devices and automation.

He had used other IOT devices and components for other projects.

His main contribution was in testing and debugging the code, to make it run as smooth as possible and optimize it.

He got over it by brainstorming using his knowledge and searching the internet for solutions of the errors.

He identified the real-life problem and did research on the compatible hardware modules.

He also helped in finalizing the electrical components needed for the hardware implementation.

Using Python and ML libraries, he made well integrated software and hardware.

He performed the necessary testing on the whole system, in different situations (i. e. (12)

, low light, blur vision, etc.

) ADITI SRIVASTAVA She has a pretty good experience in using the Raspberry Pi 4 computer, from her previous projects.

This helped us in easily installing and setting up the OS.

She identified the real-life problem and did research on the compatible hardware modules.

She also helped in finalizing the electrical components needed for the hardware implementation.

She connected the different components and IC modules to make the system work as it has to.

Using Python and ML libraries, he made well-integrated software and hardware.

She performed the necessary testing on the whole system, in different situations (i. e.

, low light, blur vision, etc.).

AYUSH DAS He has experience of working with other IOT technologies and Python programming language.

He helped us finalize the required and required/useful Python libraries.

Choosing the best libraries was a task because some functions weren’t supported in all libraries.

We had to choose the most optimized libraries and he gave us the best available ones.

He identified the real-life problem and did research on the software and libraries.

He identified the real-life problem and did research on the compatible hardware modules.

BILAL MANSOORI His knowledge on car’s hardware and software helped us know how the different things in a car/vehicle are linked and work together.

This led us towards a clearer view towards our idea and implementation.

He designed the whole braking system of the car for our project, including mechanism, hardware required and other essentials.

He identified the real-life problem and did research on the compatible hardware modules.

He also helped in finalizing the electrical components needed for the hardware implementation.

He got good knowledge on the IOT technology and ML TUSHAR RASURE He has a pretty good experience in using the Raspberry Pi 4 computer, from his previous projects.

He knows different electronic parts and this helped in choosing the best hardware, like Raspberry Pi, Robodo driver module, etc.

This helped us in easily installing and setting up the OS.

He identified the real-life problem and did research on the compatible hardware modules.

He also helped in finalizing the electrical components needed for the hardware implementation.

He got good knowledge on the IOT technology and ML SHIKHAR PRIYANI He has experience of working with other IOT technologies and Python programming language.

He helped us finalize the required and required/useful Python libraries.

Choosing the best libraries was a task because some functions weren't supported in all libraries.

We had to choose the most optimized libraries and he gave us the best available ones.

He identified the real-life problem and did research on the software and libraries.

He identified the real-life problem and did research on the compatible hardware modules 4.

CONCLUSION In this project, A real time vision-based sleep detection anti sleep alarm was proposed.

The driver normality monitoring system developed is capable of detecting drowsiness behaviors of drivers in a short time.

The Drowsiness Detection System, which is based on the drivers eye closure, can

distinguish between normal eye blink and drowsiness, as well as identify drowsiness while driving.

The proposed system can help prevent accidents caused by drowsy driving.

Even if the driver wears glasses, the device functions effectively in low light settings if the camera produces a higher output.

Various self-developed image processing methods are used to collect information about the head and eye positions.

The technology can determine if the eyes are open or closed during the monitoring.

A warning signal is given when the eyes are closed for an extended period of time.

Continuous eye closures are used to determine the driver's alertness state.

Match Urls:

0: https://www.dictionary.com/browse/stopping

1: https://morth.nic.in/sites/default/files/RA_Uploading.pdf

2: https://medium.com/transportation-matters/tech-needs-not-be-expensive-to-save-lives-9d5fbee1d1cf

3: https://www.researchgate.net/publication/275552666_DRIVER_INATTENTION

4: https://abcnews.go.com/Business/wireStory/death-toll-12-poland-mine-accidents-11-missing-84294377

5: https://www.spanishdict.com/translate/they%20are%20preventable

6: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2865224/

7: https://techprate.com/digital/5-beginner-steps-learn-machine-learning-data-science-python/

8: https://www.singaporecodingclub.com/machine-learning/

9: https://www.thefreedictionary.com/told

10: https://m.mobilelegends.com/en

11: https://www.facebook.com/pages/category/Disability-Service/lowvisionetc/posts/

12: https://www.thefreedictionary.com/%c3%8a

Keywords Density

One Word	2 Words	3 Words
drive 3.2%	identified real 0.9%	life problem research 0.9%
driver 2.9%	real life 0.9%	real life problem 0.9%
hardware 2%	life problem 0.9%	identified real life 0.9%
system 1.4%	problem research 0.9%	research compatible hardware 0.7%
driving 1.4%	compatible hardware 0.7%	compatible hardware modules 0.7%

Plagiarism Report

By check-plagiarism.com