POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

DETECTOR OF MICROSLEEP FOR CAR DRIVER USING EYE DETECTOR

NAME	REGISTRATION NO
SITI SARAH BINTI KAMARUL BAHAROM	08DEU20F2030

JABATAN KEJURUTERAAN ELEKTRIK

SESI II : 2022/2023

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This report submitted to the Electrical Engineering Department in fulfillment of the requirement for a Diploma in Electrical Engineering

JABATAN KEJURUTERAAN ELEKTRIK

SESI II : 2022 / 2023

CONFIRMATION OF THE PROJECT

The project report titled "Design a Fingers Exergame to Improve Fine Motor Skill for Autistic Children Using Arduino" has been submitted, reviewed and verified as a fulfills the conditions and requirements of the Project Writing as stipulated

Checked by:

Supervisor's name : SITI HAJAR BINTI ABDUL HAMID

Supervisor's signature:

Date : 26 MAY 2023

Verified by:

Project Coordinator name :

Signature of Coordinator :

Date :

"I acknowledge this work is my own work except the excerpts I have already explained to our source"

1. Signature : 

Name : **SITI SARAH BINTI KAMARUL BAHAROM**

Registration Number : **08DEU20F2030**

Date : 25 MAY 2023

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : DETECTOR OF MICROSLEEP FOR CAR DRIVER USING EYE DETECTOR

SESSION: SESI II : 2022 / 2023

1. I, **1. SITI SARAH BINTI KAMARUL BAHAROM (08DEU20F2030)**

   is a final year student of **Diploma in Electrical Engineering, Department of Electrical, Politeknik Sultan Salahuddin Abdul Aziz Shah**, which is located at **Persiaran Usahawan,40140 Shah Alam Selangor Darul Ehsan**. (Hereinafter referred to as 'the Polytechnic').

2. I acknowledge that 'The Project above' and the intellectual property therein is the result of our original creation /creations without taking or impersonating any intellectual property from the other parties.

3. I agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the **Diploma in Electrical Engineering** to me.

Made and in truth that is recognized by;

a) **SITI SARAH BINTI KAMARUL BAHAROM**)
(Identification card No: - 020511-08-0136))

.....
SITI SARAH BINTI KAMARUL BAHAROM

In front of me, **SITI HAJAR BINTI ABDUL HAMID** (751228065220))
As a project supervisor, on the date:)

.....
SITI HAJAR BINTI ABDUL HAMID

26 MAY 2023

ACKNOWLEDGEMENTS

I have taken efforts in this Project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them. I am highly indebted to (Name of your Organization Guide) for their guidance and constant supervision as well as for providing necessary information regarding the Project & also for their support in completing the Project.

I would like to express my gratitude towards my parents & member of (Organization Name) for their kind co-operation and encouragement which help me in completion of this Project. I would like to express my special gratitude and thanks to industry persons for giving me such attention and time.

My thanks and appreciations also go to my colleague in developing the Project and people who have willingly helped me out with their abilities.

ABSTRACT

The percentage of road accidents in Malaysia that are caused by microsleep is around 20%, and the number of incidents caused by microsleep rises year-round. Microsleep can have a variety of causes. One of them is the body's attempt to combat drowsiness, exhaustion, and inadequate sleep. For instance, a microsleep-related occurrence occurred in July 2020. Amin Faizz, a university student, perished in a motorbike accident in Linggi, Negeri Sembilan. The deceased was returning from his university in Serdang, Selangor to Kluang, Johor at the time of the event. This is due to the fact that Amin Faizz, who was striving to resist tiredness, had twice experienced microsleep before his motorbike crashed. By monitoring the driver's eye blinks, this initiative aims to identify microsleep before it occurs. The driver will wear spectacles with an LDR sensor placed in them so that the application Blynk can measure the blink rate of the driver's eyes. The driver must then modify the offset rate in accordance with the value of eye blink rate. For the LDR sensor to be able to detect the light reflected off the cornea of the eye, there is an LED on the glasses. The LDR sensor can detect the onset of microsleep if it notices that the driver's eye blinks are becoming weaker and fewer in number relative to the rate value. The buzzer and vibration system will turn on as a result, giving the motorist a heads-up to concentrate again while driving or to pause and take a breather. For repeated usage, this device can be recharged. The red LED will turn on as it charges. The LED will be blue if the charge is complete. On the Blynk app, drivers can also examine their driving information. A graph of their blinks will be shown by the Blynk app. In conclusion, because this programme contains a security component, it is particularly advantageous to people from all backgrounds and genders. The result may contribute to a decrease in traffic accidents. At the same time, it is feasible to prevent significant losses on assets that are priceless to everyone.

ABSTRAK

Sekitar 20% kes kemalangan jalan raya yang berlaku di Malaysia adalah berpunca daripada microsleep dan kes kemalangan berpunca daripada microsleep ini meningkat sepanjang tahun. Terdapat beberapa punca berlakunya microsleep. Antaranya adalah badan cuba melawan rasa mengantuk, terlalu penat dan tidak mendapat tidur yang cukup. Sebagai contoh insiden yang berpunca daripada microsleep itu pernah berlaku pada Julai 2020. Ia membabitkan seorang pelajar universiti yang dikenali sebagai Amin Faizz yang maut selepas motosikalnya terbabas di Linggi, Negeri Sembilan. Ketika kejadian, arwah dalam perjalanan pulang dari Kluang, Johor menuju ke kampusnya di Serdang, Selangor. Hal ini berpunca kerana Amin Faizz cuba untuk melawan rasa mengantuk dan sebelum motosikalnya terbabas, dia sudah mengalami microsleep sebanyak dua kali. Matlamat projek ini adalah untuk mengesan sebelum berlakunya microsleep dengan mengesan kerdipan mata oleh pemandu. Pemandu akan memakai cermin mata yang diletakkan LDR sensor untuk mendapatkan nilai rate kerdipan mata pemandu dan nilai rate tersebut akan dipaparkan pada aplikasi Blynk. Kemudian pemandu perlu melaraskan rate offset mengikut nilai rate kerdipan mata pemandu. Pada cermin mata tersebut terdapat LED yang berperanan untuk LDR sensor dapat mengesan cahaya yang disebabkan berlakunya pantulan pada kornea mata. Jika LDR sensor mengesan kerdipan mata pemandu menjadi semakin lemah dan bilangan kerdipan mata berkurang daripada nilai rate, ini menunjukkan tanda awal microsleep sedang berlaku. Ini akan mengaktifkan buzzer dan sistem getaran bagi memberikan amaran awal kepada pemandu untuk kembali fokus kepada pemanduan mereka atau berhenti untuk berehat seketika. Alat ini boleh dicas semula untuk digunakan kembali. Semasa mengecas, LED berwarna merah akan diaktifkan. Jika cas sudah penuh, LED akan berwarna biru. Pemandu juga boleh melihat data pemanduan mereka di aplikasi Blynk. Aplikasi Blynk akan memaparkan graf yang menunjukkan kerdipan mata mereka. Ringkasnya, inisiatif ini amat bermanfaat kepada semua lapisan masyarakat, tanpa mengira jantina kerana ia mempunyai elemen keselamatan. Kesannya boleh membantu dalam mengurangkan bilangan kejadian berlakunya kemalangan jalan raya. Pada masa yang sama, dapat mengelakkan kerugian besar mengenai harta yang bernilai kepada semua orang.

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CHAPTER 1

1 INTRODUCTION

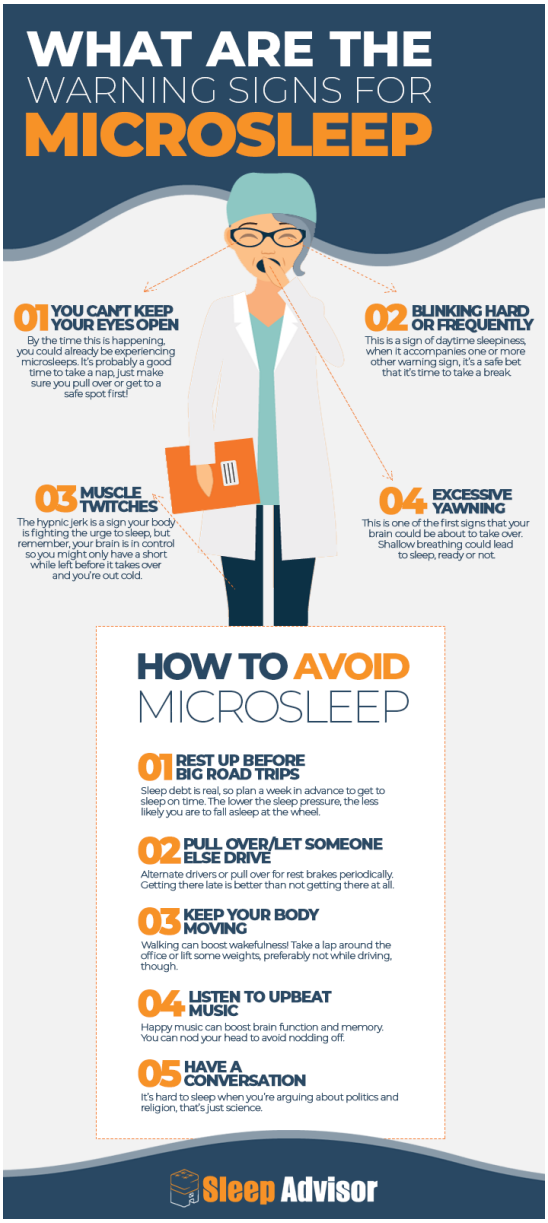
1.1 Introduction

Microsleep refers to a brief episode of sleep that occurs when a person is awake and performing a task, such as driving, working, or studying. These episodes typically last only a few seconds, but they can have serious consequences if they occur while a person is engaged in a potentially dangerous activity, such as driving a car or operating heavy machinery.

During a microsleep episode, the brain enters a sleep-like state, and the person may experience a feeling of drowsiness, head nodding, or even falling asleep for a brief moment. Microsleep can be caused by a variety of factors, including sleep deprivation, sleep disorders, medications, and alcohol consumption.

Microsleep episodes can be dangerous because they can cause a person to lose concentration, miss important information, or make errors while performing tasks. In situations where a person is driving, operating heavy machinery, or performing other high-risk activities, microsleep can lead to accidents and injuries.

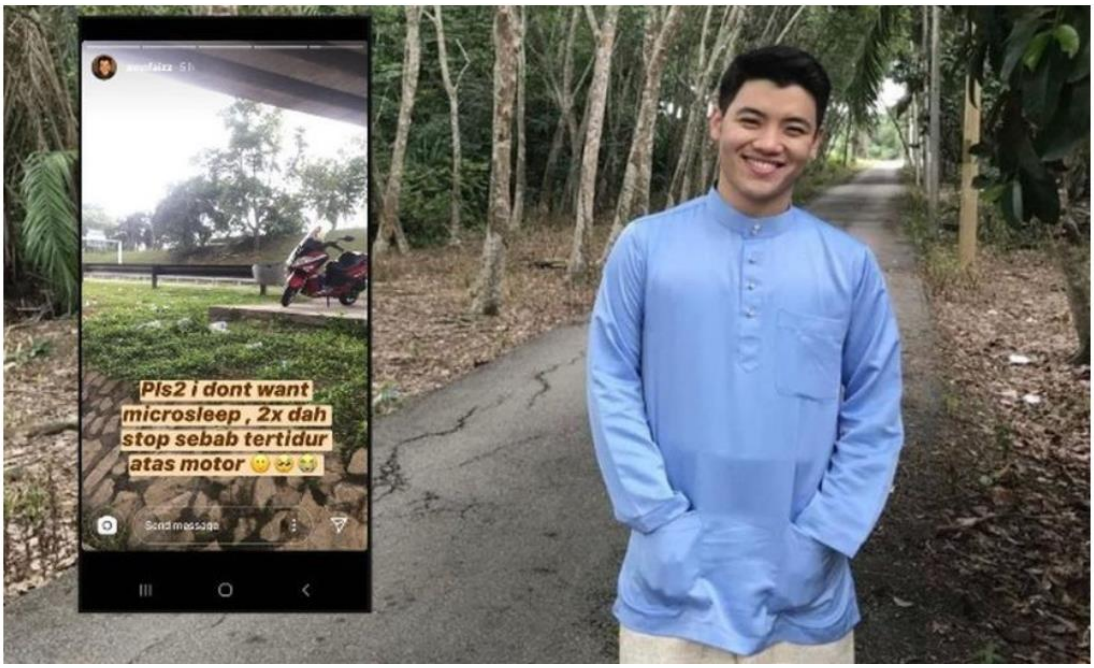
To prevent microsleep episodes, it is important to get enough sleep each night, maintain a healthy lifestyle, and avoid activities that can cause fatigue, such as drinking alcohol or using drugs. If you are experiencing microsleep episodes, it is important to talk to a healthcare professional to identify the underlying cause and develop an appropriate treatment plan.



Around 20% of traffic accidents in the nation are caused by exhaustion and drowsiness, according to the Malaysian Institute of traffic Safety Research (MIROS). It is unknown, though, how many of these mishaps are specifically brought on by microsleep.

MIROS advises drivers to acquire enough sleep before driving, take frequent breaks during lengthy distances, and steer clear of operating a vehicle when they would typically be resting in order to lower the risk of accidents brought on by sleepy driving. Additionally, they advise that drivers take appropriate action to address any warning indications of drowsiness, such as difficulties maintaining focus or keeping their eyes open, by paying attention to them.

For instance, a microsleep-related occurrence occurred in July 2020. Amin Faizz, a university student, perished in a motorbike accident in Linggi, Negeri Sembilan. The deceased was returning from his university in Serdang, Selangor to Kluang, Johor at the time of the event. This is due to the fact that Amin Faizz, who was striving to resist tiredness, had twice experienced microsleep before his motorbike crashed.



Microsleep is a temporary episode of sleep that can occur when a person is sleep-deprived or fatigued. It is a common cause of accidents, particularly among drivers who are behind the wheel for long periods or at times when they would normally be sleeping. Some tips to help avoid the microsleep:

Get Enough Sleep: The most important way to avoid microsleep is to ensure that you get enough sleep on a regular basis. Adults typically need 7-9 hours of sleep per night, although individual needs can vary. Try to establish a regular sleep routine and stick to it as much as possible.

Take Regular Breaks: If the driving or engaged in an activity that requires prolonged attention, be sure to take regular breaks. This can help prevent fatigue and keep you alert. Take a break every 2-3 hours or whenever you feel tired.

Avoid Driving During The Normal Sleep Time: If possible, avoid driving during the times when we would normally be sleeping. This can help prevent drowsiness and reduce the risk of microsleep.

Avoid Alcohol and Sedatives: Alcohol and sedatives can interfere with sleep and increase the risk of drowsiness and microsleep. If we need to take medication that causes drowsiness, avoid driving or operating heavy machinery.

Stay Active: Regular exercise and physical activity can help improve sleep quality and reduce the risk of fatigue. Aim for at least 30 minutes of moderate-intensity exercise most days of the week.

Take Naps: If feel tired during the day, taking a short nap can help restore alertness and prevent microsleep. Keep naps short (20-30 minutes) and avoid napping too close to bedtime.

The best way to prevent microsleep is to ensure that we get enough sleep on a regular basis. If we consistently feeling tired or having trouble sleeping, talk to doctor or a sleep specialist for advice.

1.2 Background Research

A brief, involuntary sleep episode known as microsleep can last anywhere from a few seconds to several minutes. It can happen when a person is sleep deprived or exhausted and can be a significant risk factor for accidents, especially in circumstances that call for prolonged focus, such operating heavy machinery or driving.

The following are some important outcomes of research on microsleep:

1. Factors that produce microsleep include sleep deprivation, shift work, sleep disorders, drugs, and illnesses that have a negative impact on sleep. It most frequently affects persons who are sleep deprived or exhausted.
2. Microsleep's effects: During an episode of microsleep, the brain briefly closes down, causing a loss of awareness and attention. Accidents may result from this, which is especially risky when driving or using large machinery that requires constant attention.
3. Microsleep Detection: Microsleep can happen suddenly and frequently goes unnoticed by the person who is experiencing it, making it difficult to identify. However, scientists have created a number of techniques to identify microsleep, including behavioural testing, eye-tracking equipment, and EEG (electroencephalogram) monitoring.
4. Microsleep prevention: Consistently getting enough sleep is the best approach to prevent microsleep. Ask your doctor or a sleep specialist for guidance if

you frequently feel fatigued or have difficulties falling asleep. Taking frequent pauses, abstaining from driving while you would normally be sleeping, and avoiding alcohol and sedatives are further preventative techniques.

5. 5. Effect of Microsleep on Safety: Microsleep can seriously affect safety, especially in circumstances that call for prolonged concentration, like driving. According to estimates, sleepy driving causes tens of thousands of collisions each year that result in fatalities and serious injuries. As a result, it's critical that both individuals and organisations take action to stop sleepy driving in general and microsleep in particular.

This table show the cases of road accidents in Malaysia caused by microsleep:

YEAR	CASES
2010	16,817
2011	19,606
2012	17,937
2013	17,831
2014	18,488
2015	20,458
2016	20,982
2017	22,402
2018	22,411
2019	24,461

Cases of road accidents in Malaysia caused by microsleep

1.3 Problem Statement

Every driver should have a tool that can identify and alert them before microsleep happens. This is due to the fact that a weary driver cannot pay attention when operating a vehicle. Drivers' and innocent people's lives will be in danger as a result. Additionally, this will result in more traffic collisions. Additionally, because there is no technology to help drivers identify the early signs of microsleep, they are unable to receive an early warning when they begin to experience it.

1.4 Research Objectives

The main objective of this Project is to give the driver a early signs of microsleep. More specifically the principle objective of this research are:

1. To develop a device that can aid drivers in maintaining concentration while driving.
2. To signal the driver to resume concentration on his driving after a microsleep.
3. To lessen the chance of microsleep-related auto accidents.

1.5 Scope of Research

Microsleep poses a serious risk to drivers, who frequently lose control of their vehicles when they do so and cause numerous traffic accidents. A catastrophic scenario can be avoided by recognising early indications of weariness and drowsiness. Using a technique called microsleep detection, accidents caused by sleepy drivers can be avoided. The goal of this project is to create a microsleep detector for drivers of cars that uses an eye detector and image processing to determine whether the driver is feeling fatigued or drowsy. In order to prevent accidents, The focus of this project is to give the early signs before the driver experiences the microsleep. The buzzer and the vibrating system will be activated when the early signs of microsleep are detected. The main controller of this project is using Node MCU. This project will be designed and the budget estimate for the implementation of this project is not over RM500.

1.6 Project Significance

The driver must then adjust the offset rate in line with the eye blink rate value. An LED is located on the spectacles in order for the LDR sensor to be able to detect the light reflected off the cornea of the eye. If the LDR sensor observes that the driver's eye blinks are weakening and decreasing in number relative to the rate value, it will know that microsleep has begun. As a result, the buzzer and vibration system will activate, giving the driver a warning to concentrate while driving once more or to stop and take a break. This device may be recharged for continued use. While it is charging, the red LED will illuminate. Indicating that the charge is finished is the LED turning blue. Drivers can review their driving data on the Blynk app as well. The Blynk app will display a graph of their blinks in real time.

1.7 Chapter Summary

The Detector of Microsleep for Driver using Eye Detector project is introduced in this chapter. The next step is background research, which also includes learning about previous studies and what microsleep is. The problem statement, research objectives, study scope, and project importance are all included in this chapter.

CHAPTER 2

2 LITERATURE REVIEW

2.1 Introduction

A person who microsleeps does so for a brief period of time. Those who experience this microsleep may be able to doze off unintentionally. Microsleep is a sort of sleep that can happen while someone is engaged in an activity, such as driving. Slow blinking, a blank expression, dropping your head, having unexpected bodily twitches, being unable to recall the previous one or two minutes, and not responding to information are a few signs of microsleep. The difficulty to keep your eyes open, excessive yawning, body twitches, and continual blinking to stay awake are some of the early symptoms of microsleep. Inadequate or poor-quality sleep is one of the causes of microsleep. As an illustration, someone must work the night shift. A blockage in your upper airway prevents you from breathing normally while you sleep if you have obstructive sleep apnea. Your brain doesn't get enough oxygen during sleep as a result, which might cause drowsiness during the day. Another one of these is narcolepsy, which results in sporadic, uncontrollable episodes of falling asleep.

2.2 Driver Performance in the Moments Surrounding a Microsleep.

2.2.1 Objective of the research

The goal of this study was to determine if drowsy drivers have deterioration in driving performance during EEG verified microsleep episodes compared to performance during wakefulness.

2.2.2 Method of the research

The clinical criteria for the diagnosis of OSAS were a complaint of excessive daytime sleepiness or insomnia, witnessed or self-reported episodes of obstructed breathing during sleep, and at least one of the following; snoring, morning headaches, or dry mouth upon awakening.

Table 1
The effects of microsleeps (and comparison non-microsleeps) on driving performance measures by road type

Dependent variables	Roadway	Episodes[a]	*N*	Mean	s.d.
Mean speed (km/h)	Straight	Microsleep	117	26.363	3.263
		Non-microsleep	231	26.576	2.669
	Curve	Microsleep	34	26.354	3.132
		Non-microsleep	68	26.633	2.129
SDLP (m)	Straight	Microsleep	117	0.160	0.122
		Non-microsleep	231	0.142	0.104
	Curve	Microsleep	34	0.209	0.127
		Non-microsleep	68	0.169	0.101
SDSWA	Straight	Microsleep	117	1.967	1.763
		Non-microsleep	231	1.782	1.735
	Curve	Microsleep	34	2.946	1.840
		Non-microsleep	68	2.882	1.862
Steering entropy	Straight	Microsleep	117	0.564	0.049
		Non-microsleep	231	0.551	0.060
	Curve	Microsleep	68	0.557	0.062
		Non-microsleep	34	0.567	0.397
Minimum TLC	Straight	Microsleep	117	3.828	3.062
		Non-microsleep	231	3.082	2.215
	Curve	Microsleep	68	0.766	0.530
		Non-microsleep	34	0.997	0.837

[a] *Note:* Driving performance on a drive segment where a microsleep occurred are matched with the performance at the corresponding location in the other two segments.

2.2.3 Result of the research

Drowsy drivers with OSAS show deterioration in simulated driving performance during EEG-verified microsleeps. The degree of deterioration correlated with microsleep duration and was worse when microsleeps occurred on curved road segments. Identifying how microsleep episodes influence driving behavior may prove to be relevant to the design and implementation of countermeasures, such as drowsy driver detection and alerting systems.

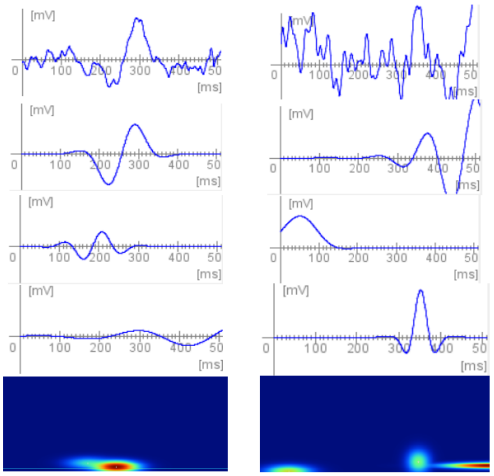
2.3 Cognitive Event-Related Potential Waveform Latency Determination

2.3.1 Objective of the research

The determination of latency of a cognitive ERP waveform from outputs of two algorithms we use for its detection and which we have the best experience with.

2.3.2 Method of the research

Section II gives a basic overview of event related potentials in general and continues with choice of a cognitive ERP suitable for our purpose. Sections III and IV introduce HHT and MP based algorithm including the way of determining cognitive ERP waveform latency from their outputs. Section V introduces validation experiment and summarizes its results. Eventually, Section VI contains conclusion and introduces future work.



2.3.3 Result of the research

Show two algorithms suitable for determining of P3 waveform. In case of latency determining algorithm based on MP, 85 % of determined latency deviations falls within the range <-9 ms, 9 ms> (see Tab. 2 and Fig. 9). In case of HT based algorithm, it is 70 %.

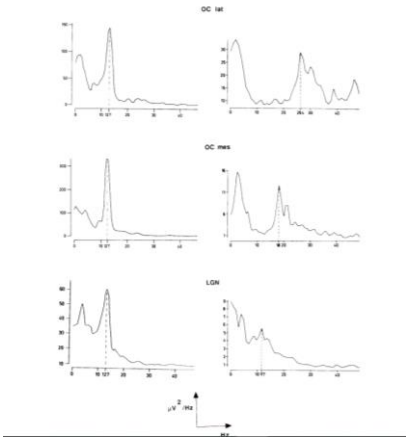
2.4 Neural Mechanisms Underlying Brain Waves: from Neural Membranes to Network

2.4.1 Objective of the research

The objectives of this research at the cellular level, the evidence that certain types cf neuron have intrinsic oscillatory properties that may underlie rhythmic EEG activities. Another that, at the neural network level, new findings have clarified the dynamics of the main circuits responsible for the occurrence and modulation of rhythmic behaviour in neural populations. Lastly at the theoretical level, the demonstration that neuronal networks may behave as complex dynamic systems with the properties of deterministic chaos has challenged the classic ideas about how EEG signals should be interpreted and analysed.

2.4.2 Method of the research

It may be concluded that experimental evidence is accumulating that justifies the statement that EEG signals can reflect the functional states of neuronal networks.



2.4.3 Result of the research

The fact that brain rhythms may have functional implications for the working of neural networks is examined in relation to 2 cases: the possibility that oscillations

may subserve a gating function, and that oscillations may play a role in the formation of assemblies of neurons that represent given stimulus patterns.

2.5 Detecting Approach of Emergency Vehicles using Siren Sound Processing

2.5.1 Objective of the research

To detect and identify types of emergency vehicles, we used two methods based on frequency and chronological data. Each emergency vehicle uses sirens that sound at frequencies set by regulation.

2.5.2 Method of the research

Accordingly, the conditions of the first assessment method were based on extracting frequency characteristics using the aforementioned spectral analysis. Many sirens are also characterized by cyclical sounds. Therefore, the second method involved comparisons with the frequency having the strongest spectrum from the previous cycle. Using these shared conditions for detection, the following sections describe the methods used to assess the various emergency vehicles.

2.5.3 Result of the research

From this result, it was confirmed that siren sound can be detected even while driving. In addition, it was shown that engine sound is a big hindrance factor in detection. In addition, it was found that the faster the vehicle speed, the shorter the detection time is required.

2.6 NODEMCU V3 for Fast IOT Applications Development

2.6.1 Objective of the research

The NodeMCU is an open-source development board designed for IoT projects. Its main objective is to provide an affordable and user-friendly platform for prototyping and building IoT applications. The NodeMCU focuses on enabling wireless connectivity, integrating sensors and actuators, and supporting rapid development through its built-in USB-to-serial converter. It offers a Lua-based firmware for easy programming and has a thriving open-source community for collaboration and support. In summary, the The NodeMCU is an open-source development board designed for IoT projects. Its main objective is to provide an affordable and user-friendly platform for prototyping and building IoT applications. The NodeMCU focuses on enabling wireless connectivity, integrating sensors and actuators, and supporting rapid development through its built-in USB-to-serial converter. It offers a Lua-based firmware for easy programming and has a thriving open-source community for collaboration and support. In summary, the NodeMCU aims to simplify and accelerate IoT development by combining a microcontroller with Wi-Fi capabilities in a cost-effective and accessible package.ith Wi-Fi capabilities in a cost-effective and accessible package.

2.6.2 Method of the research

The NodeMCU can be programmed and used in various ways. The primary methods include programming it through the Arduino IDE using C/C++ and Arduino libraries, using Lua scripting directly on the NodeMCU board, utilizing MicroPython for Python-based development, customizing the NodeMCU firmware itself, and using the PlatformIO development platform. The choice of method depends on individual preferences, project needs, and familiarity with the programming languages involved.

2.6.3 Result of the research

The NodeMCU is a versatile development board that serves as a platform for creating IoT applications. Its result is dependent on how it is programmed and utilized. It enables wireless communication, sensor integration, and rapid prototyping. The NodeMCU can be used to build projects such as home automation systems, environmental monitoring devices, and remote sensing applications. It is also widely used for educational purposes to learn about IoT and programming. Ultimately, the NodeMCU's outcome is determined by the user's creativity and goals, providing a flexible and powerful tool for IoT development.

2.7 Chapter Summary

The literature analysis finishes by summarising the major discoveries from the studies that were reviewed and underlining the significance of ongoing research and advancement in microsleep detection. To improve the accuracy and usefulness of

microsleep detection systems, it highlights the necessity of interdisciplinary collaboration and standardisation.

This study offers an invaluable resource for researchers, practitioners, and policymakers interested in comprehending the current status of microsleep detection and determining future research directions by doing a thorough assessment of the literature.

CHAPTER 3

3 RESEARCH METHODOLOGY

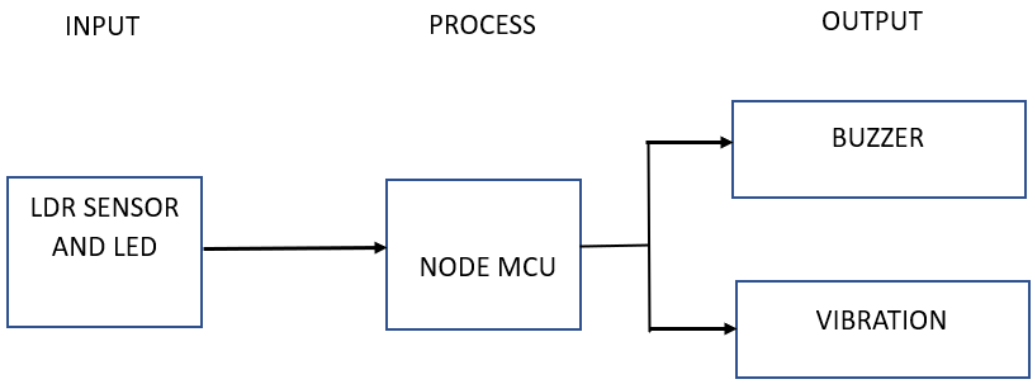
3.1 Introduction

To realize this Project as a product that ready to use with safety characteristic, a very comprehensive plan is undertaking. A step by step procedure is done so that the Project can be completed in time. This include the process to carry out this project and the project design.

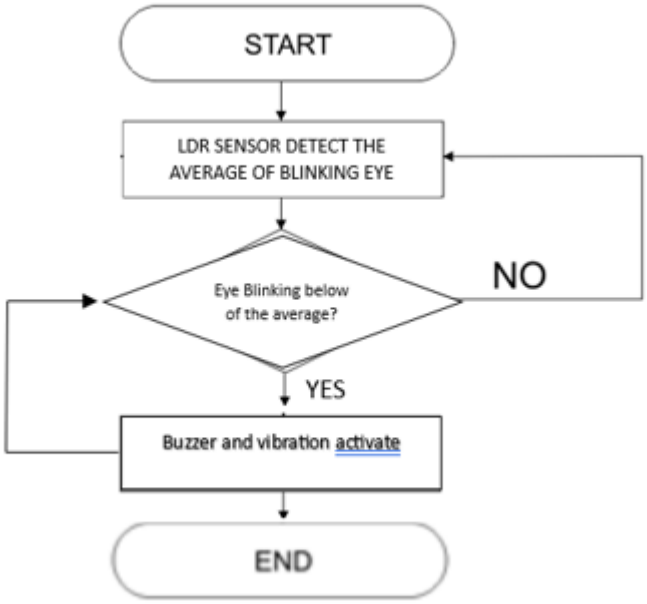
3.2 Project Design and Overview.

As mention in the previous chapter, the designed controller is using a closed-loop system with Node MCU as the main controller. The design of the controller circuit using Arduino realizes using Proteus Software and then convert to PCB circuit. Node MCU function is to give the output at Blynk application.

3.2.1 Block Diagram of the Project



3.2.2 Flowchart of the Project 2



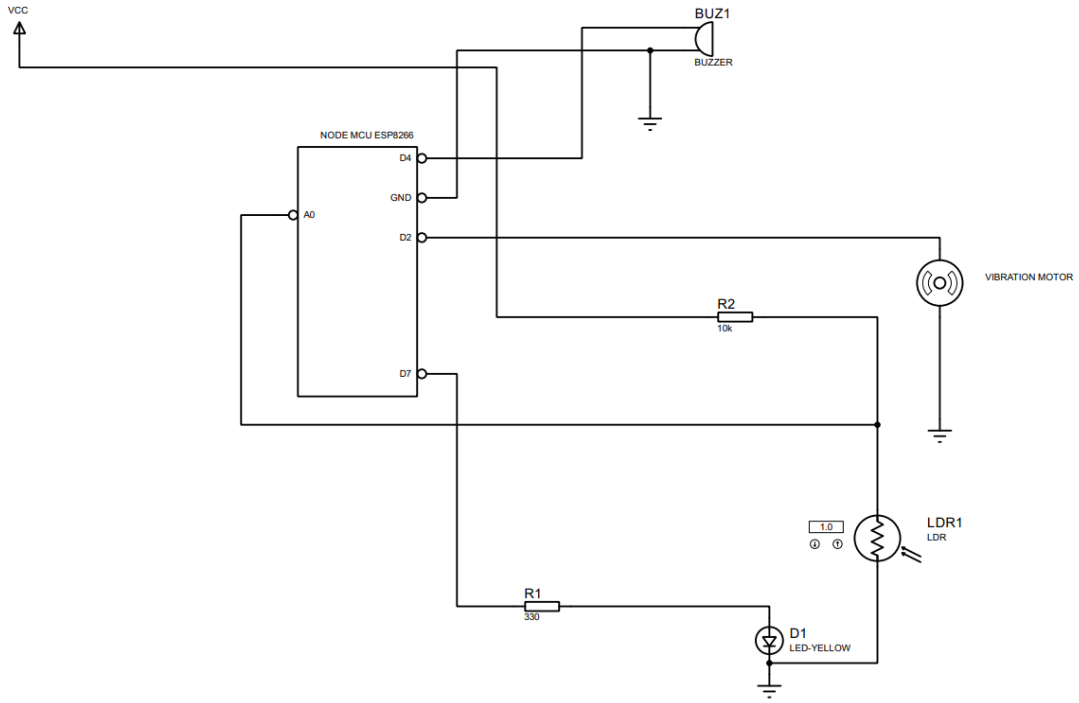
3.2.3 Project Description

Following that, the driver must modify the offset rate to correspond with the eye blink rate value. In order for the LDR sensor to pick up light reflected off the cornea of the eye, an LED is placed on the eyewear. The onset of microsleep can be determined by the LDR sensor if it notices that the driver's eye blinks are becoming weaker and fewer in number in comparison to the rate value. As a result, the buzzer and vibration system will go off, alerting the driver to resume paying attention to the road or to pull over and take a break. For continuing use, this device can be recharged. The red LED will shine while it is charging. The LED turns blue when the charge is complete, signalling completion. On the Blynk app, drivers may also review their driving information. The Blynk app will provide a live graph of their blinks.

3.3 Project Hardware

By monitoring the driver's eye blinks, this initiative aims to identify microsleep before it occurs. The driver will wear spectacles with an LDR sensor placed in them so that the application Blynk can measure the blink rate of the driver's eyes. The driver must then modify the offset rate in accordance with the value of eye blink rate. For the LDR sensor to be able to detect the light reflected off the cornea of the eye, there is an LED on the glasses. The LDR sensor can detect the onset of microsleep if it notices that the driver's eye blinks are becoming weaker and fewer in number relative to the rate value. The buzzer and vibration system will turn on as a result, giving the motorist a heads-up to concentrate again while driving or to pause and take a breather. For repeated usage, this device can be recharged. The red LED will turn on as it charges. The LED will be blue if the charge is complete. On the Blynk app, drivers can also examine their driving information. A graph of their blinks will be shown by the Blynk app.

3.3.1 Schematic Circuit



3.3.2 Description of Main Component

3.3.2.1 Node MCU

NodeMCU is an open-source firmware and development board that is based on the popular ESP8266 Wi-Fi module. It provides an easy-to-use platform for Internet of Things (IoT) projects and allows developers to quickly prototype and build Wi-Fi-enabled devices.

Key Features of NodeMCU:

1. ESP8266 Wi-Fi Module: NodeMCU is built around the ESP8266 Wi-Fi module, which integrates a microcontroller and Wi-Fi capabilities. The ESP8266 chip provides robust Wi-Fi connectivity and supports TCP/IP protocols, making it suitable for IoT applications.
2. Lua-based Firmware: NodeMCU firmware is based on the Lua scripting language, which simplifies the development process for IoT projects. Lua is a lightweight scripting language that is easy to learn and offers a range of built-in functions for network communication and data manipulation.
3. Development Board: NodeMCU is available as a compact development board that includes the ESP8266 module, USB-to-serial converter, and other necessary components. The board provides GPIO pins for connecting sensors, actuators, and other peripherals, making it suitable for a wide range of IoT applications.
4. Integrated Development Environment (IDE): NodeMCU is typically programmed using the Arduino IDE or the NodeMCU-specific firmware

programming tool called ESPlorer. These IDEs provide a user-friendly interface for writing, compiling, and uploading firmware to the NodeMCU board.

5. Wi-Fi Connectivity: One of the main advantages of NodeMCU is its built-in Wi-Fi capability. It enables devices to connect to local networks or the internet, facilitating communication and data transfer between the device and other networked devices or cloud services.
6. GPIO Support: NodeMCU offers multiple General Purpose Input/Output (GPIO) pins, which can be used to interface with a variety of sensors, actuators, and other electronic components. This allows developers to create interactive and responsive IoT applications.
7. Libraries and Community Support: NodeMCU has a large and active community of developers, which has resulted in the development of numerous libraries and resources. These resources provide pre-built functions and examples for various tasks, making it easier to develop applications and troubleshoot issues.

3.3.2.2 Buzzer

An electric buzzer or beeper is activated by a buzzer function, which makes an audible sound. This can be helpful for a number of purposes, including warning users of occurrences, pointing out faults, or offering feedback.

The hardware and programming language utilised will determine how a buzzer function is implemented precisely. However, in most cases, a buzzer function will require turning on a digital output pin that is attached to the buzzer, which will cause it to vibrate at a frequency that generates an audible sound.

3.3.2.3 LDR Sensor

An electrical component known as an LDR (Light Dependent Resistor) sensor adjusts its resistance in response to variations in ambient light levels. As a result, it can be used as a valuable component in many applications, including automatic lighting control, light intensity monitoring, and even light-controlled robotics.

Typically, LDR sensors are made of a semiconductor material like cadmium sulphide (CdS), which exhibits a decrease in resistance with increasing light intensity. An LDR's resistance, which is commonly expressed in ohms, can vary from several kilo-ohms in complete darkness to only a few ohms in intense light.

An LDR sensor is commonly used in a circuit by being wired in series with a resistor to create a voltage divider circuit. The resistance of the LDR may then be determined using Ohm's equation (R = V/I), where R is the resistance, V is the voltage across the LDR, and I is the current flowing through the circuit. This is done by measuring the output voltage of the circuit across the LDR.

3.3.2.4 USB Charger

The 5V Micro USB 1A 4.2V Li-ion Battery Charger with Protection TP4056 Chip is a charging module specifically designed for lithium-ion (Li-ion) batteries. Its primary function is to safely charge the Li-ion battery using a 5V power source, such as a USB port or a USB wall adapter.

Here's a breakdown of the functions and features of the charger module:

1. Charging: The module allows you to charge a single Li-ion battery with a nominal voltage of 3.7V. It provides a charging current of up to 1A, which is suitable for most small to medium-sized Li-ion batteries. The charging process is initiated by connecting the 5V power source, typically through a Micro USB connector.
2. Voltage Regulation: The charger module regulates the charging voltage to ensure that the Li-ion battery is charged safely and efficiently. It provides a constant charging voltage of 4.2V, which is the recommended voltage for charging most Li-ion batteries.
3. Charging Protection: The module incorporates a TP4056 chip, which offers various protection features to ensure safe charging. These protections include overcurrent protection, overvoltage protection, undervoltage lockout, and over-temperature protection. These safety mechanisms help prevent damage to the battery and the charging circuitry.
4. Charging Indicator: The module often includes LED indicators to provide visual feedback on the charging status. Typically, there are two LEDs—one indicates that the charger is powered, and the other shows the charging status

(e.g., red for charging and green for fully charged). This allows users to easily monitor the charging process.

5. Compact Size: The charger module is usually compact and lightweight, making it convenient for portable devices and applications.

Overall, the 5V Micro USB 1A 4.2V Li-ion Battery Charger with Protection TP4056 Chip serves as a reliable and safe charging solution for Li-ion batteries, providing regulated charging voltage, protection features, and convenient indicators for monitoring the charging status.

3.3.2.5 Battery

Nokia phones typically use rechargeable Lithium-ion (Li-ion) or Lithium-polymer (Li-poly) batteries. These batteries are designed to be recharged multiple times, providing a longer lifespan compared to disposable batteries. The specific type of battery used in a Nokia phone may vary depending on the model and generation of the device.

Advantages of Rechargeable Batteries:

1. Reusability: Rechargeable batteries can be charged and used repeatedly, eliminating the need for constant replacement and reducing electronic waste.
2. Cost-effective: While rechargeable batteries may have a higher upfront cost, they are more cost-effective in the long run as they can be recharged hundreds or even thousands of times before needing replacement.

3. Environmental Impact: Using rechargeable batteries reduces the number of disposable batteries that end up in landfills, which helps to minimize environmental pollution.
4. Convenience: With a rechargeable battery, you can easily recharge your Nokia phone whenever needed, eliminating the need to carry around spare batteries or search for replacements.
5. Performance: Rechargeable batteries generally provide stable power output throughout their discharge cycle, ensuring consistent performance for your Nokia phone.

3.3.2.6 LED

When an electric current is applied to an LED (Light Emitting Diode) in the forward direction, the LED's purpose is to emit light. LEDs are semiconductor devices that use the electroluminescence process to transform electrical energy into light energy.

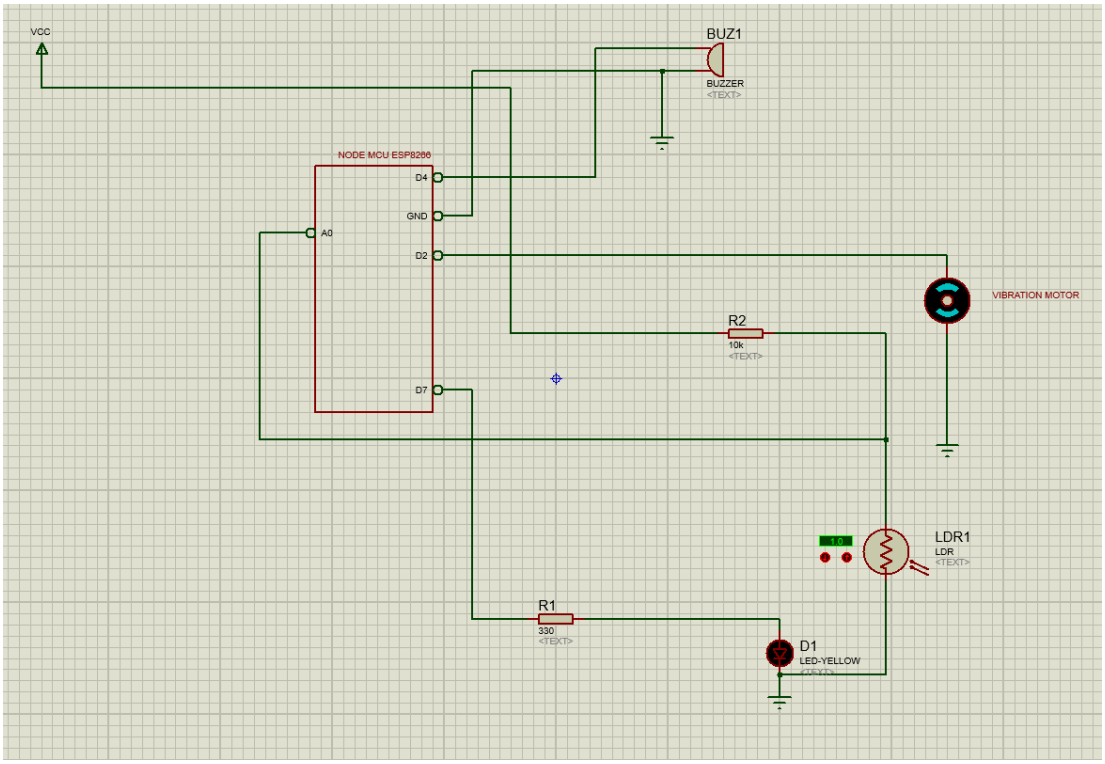
Electrons are energised and migrate from the semiconductor material's higher energy level to its lower energy level when a voltage is supplied to the LED. Photons, or light particles, are released as energy by the transitioning electrons. The materials used to build the LED have an impact on the colour of the light it emits, with different semiconductor materials yielding various hues.

In comparison to conventional light sources like incandescent bulbs, LEDs have a number of advantages. They are extremely energy-efficient, turning a significant amount of electrical energy into light with little heat loss. Additionally, LEDs last longer, are tougher, and come in a variety of colours.

Numerous fields utilise LEDs extensively. In electrical equipment, such as power buttons, status indicators, and displays, they are frequently utilised as indicator lights. Due to its energy efficiency and extended lifespan, LEDs are also commonly utilised in general illumination, including indoor and outdoor lighting in homes and businesses. LEDs are also utilised in a variety of other applications, including screen backlighting, signage, and automobile lighting.

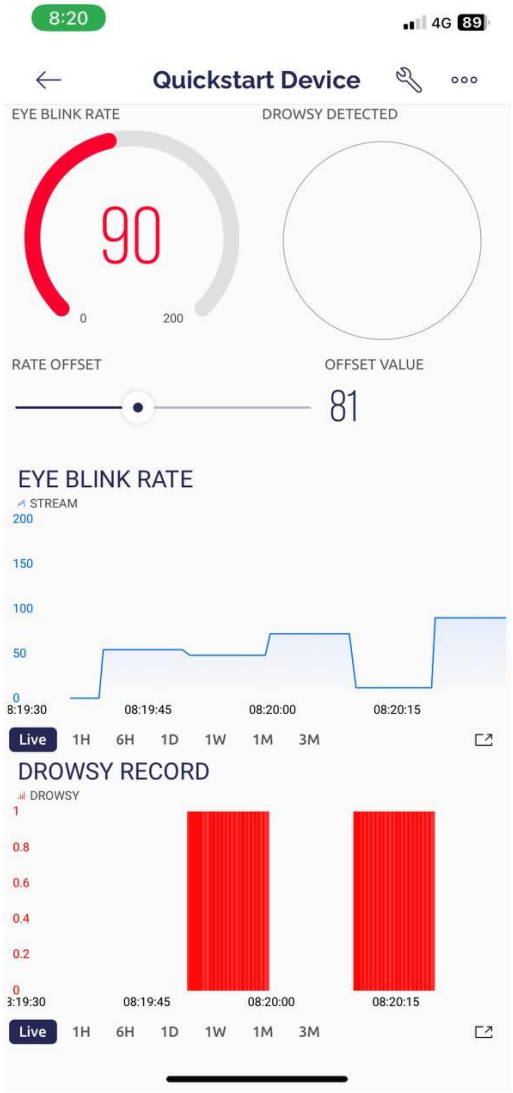
In general, an LED's aim is to deliver effective and adjustable light output for a variety of uses, from straightforward indicator lights to sophisticated lighting systems.

3.3.3 Circuit Operation



3.4 Project Software

By monitoring the driver's eye blinks, this initiative aims to identify microsleep before it occurs. The driver will wear spectacles with an LDR sensor placed in them so that the application Blynk can measure the blink rate of the driver's eyes. The driver must then modify the offset rate in accordance with the value of eye blink rate. For the LDR sensor to be able to detect the light reflected off the cornea of the eye, there is an LED on the glasses. The LDR sensor can detect the onset of microsleep if it notices that the driver's eye blinks are becoming weaker and fewer in number relative to the rate value. The buzzer and vibration system will turn on as a result, giving the motorist a heads-up to concentrate again while driving or to pause and take a breather. For repeated usage, this device can be recharged. The red LED will turn on as it charges. The LED will be blue if the charge is complete. On the Blynk app, drivers can also examine their driving information. A graph of their blinks will be shown by the Blynk app.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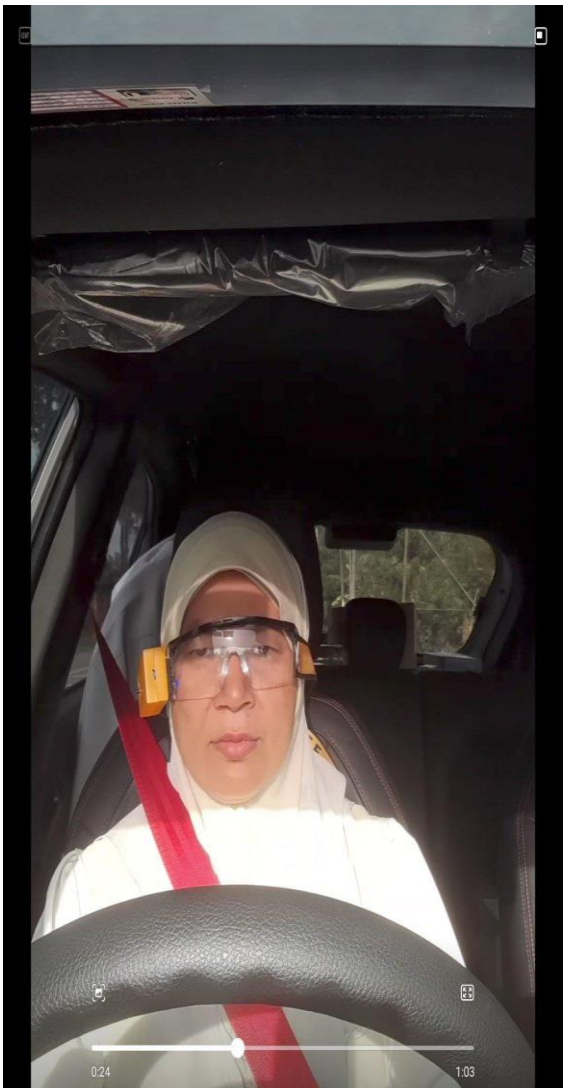
4G 89
Quickstart Device
EYE BLINK RATE
DROWSY DETECTED
90
0
200
RATE OFFSET
OFFSET VALUE
81
EYE BLINK RATE
STREAM
200
150
100
50
0
8:19:30
08:19:45
08:20:00
08:20:15
Live
1H
6H
1D
1W
1M
3M
DROWSY RECORD
DROWSY
1
0.8
0.6
0.4
0.2
0
3:19:30
08:19:45
08:20:00
08:20:15
Live
1H
6H
1D
1W
1M
3M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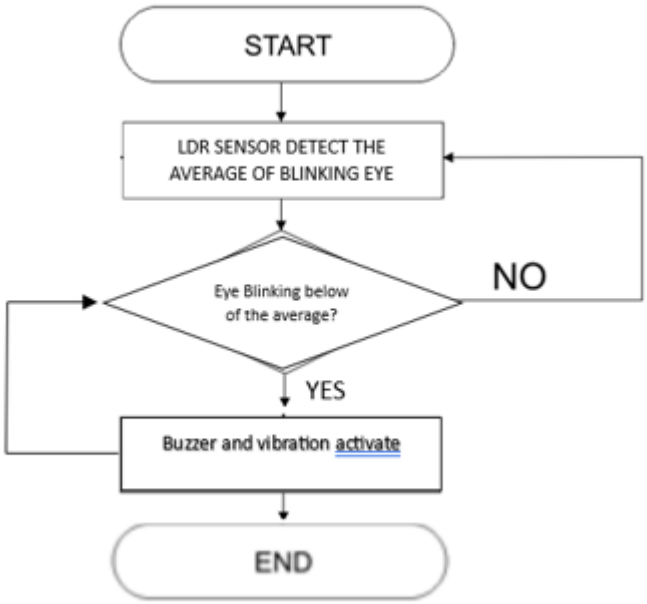
3.4.1 Flowchart of the System



3.4.2 Description of Flowchart

By monitoring the driver's eye blinks, this initiative aims to identify microsleep before it occurs. The driver will wear spectacles with an LDR sensor placed in them so that the application Blynk can measure the blink rate of the driver's eyes. The driver must then modify the offset rate in accordance with the value of eye blink rate. For the LDR sensor to be able to detect the light reflected off the cornea of the eye, there is an LED on the glasses. The LDR sensor can detect the onset of microsleep if it notices that the driver's eye blinks are becoming weaker and fewer in number relative to the rate value. The buzzer and vibration system will turn on as a result, giving the motorist a heads-up to concentrate again while driving or to pause and take a breather. For repeated usage, this device can be recharged. The red LED will turn on as it charges. The LED will be blue if the charge is complete. On the Blynk app, drivers can also examine their driving information. A graph of their blinks will be shown by the Blynk app.

3.5 Prototype Development

Project is represented by the prototype up top. by utilising a few tools, such as safety goggles, a hot glue gun, a soldering iron, and some hand tools for drilling and cutting the holes. All of the components that we need for the project's size were first measured. The components are all placed in the casing after the measurement is completed. To ensure that the components stay in place, we utilise a hot glue gun after that.

3.5.1 Mechanical Design/Product Layout

3.6 Sustainability Element in The Design Concept

In this project, we will make a microsleep detector for car driver using eye detector using the safety glases and the components such as node MCU to make sure this project going smoothly.

3.7 Chapter Summary

In this chapter, there is research of methodology. I find the way or the method that we use to make a project become real. We have to list and describe the components that we use to make a project. There is also a block diagram, flow chart and the schematic circuit in this chapter.

CHAPTER 4

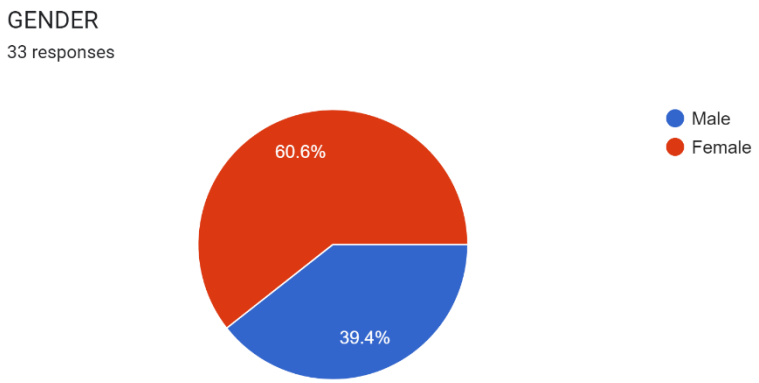
4 RESULTS AND DISCUSSION

4.1 Introduction

In this section, it will delve into the importance of the result and analysis chapter, discussing its role in providing meaningful interpretations and insights. We will explore the key steps involved in analyzing data or information, including data cleaning, organization, and the application of suitable analytical methods. Furthermore, rhis chapter will emphasize the significance of accurate and unbiased interpretation to ensure the validity and reliability of the results. By presenting a comprehensive and well-structured result and analysis section, researchers and analysts can contribute to the existing knowledge base, validate their research objectives, and provide valuable insights that inform decision-making processes.

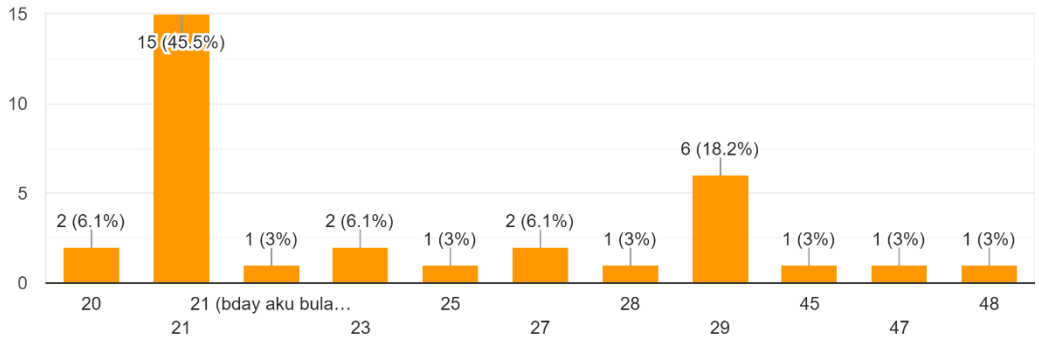
4.2 Results and Analysis

From this analysis data, we can see this product will help many people to prevent them from microsleep.



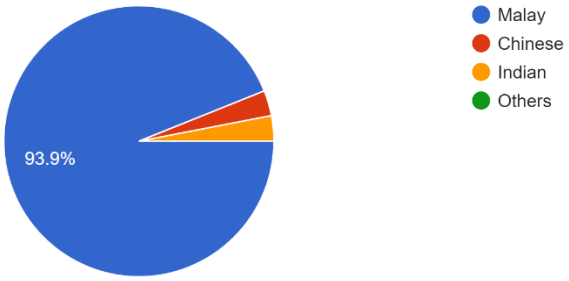
AGE

33 responses



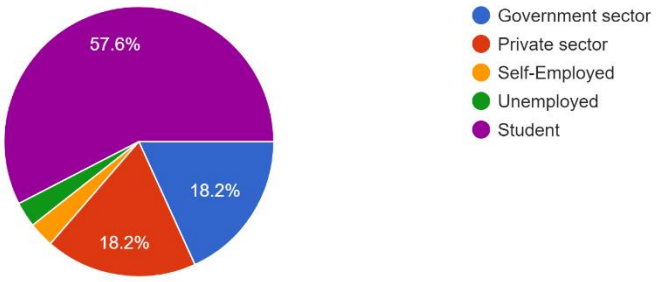
ETHNICITY

33 responses



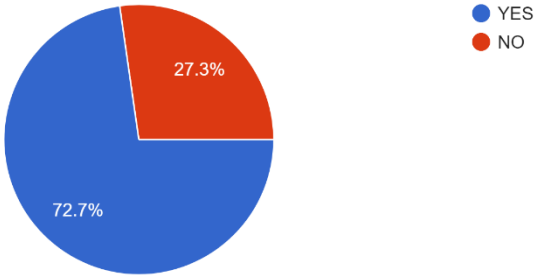
OCCUPATION

33 responses



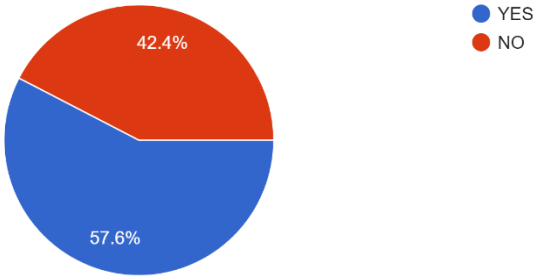
QUESTON 1 Have you ever experienced drowsiness or fatigue while driving?

33 responses



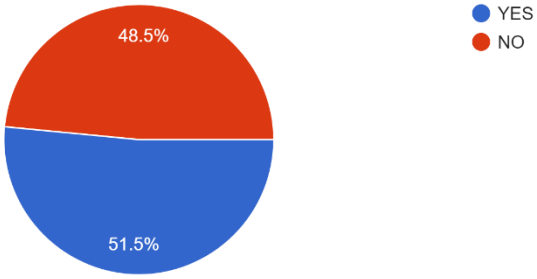
QUESTION 2 How frequently do you drive long distances (e.g., more than 2 hours)?

33 responses



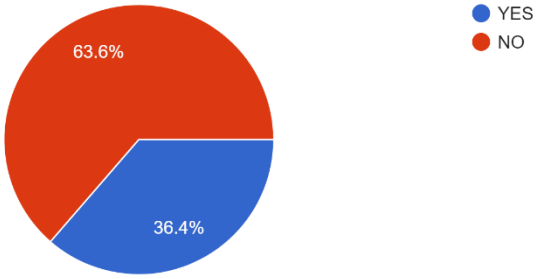
QUESTION 3 Have you ever experienced a microsleep episode while driving?

33 responses



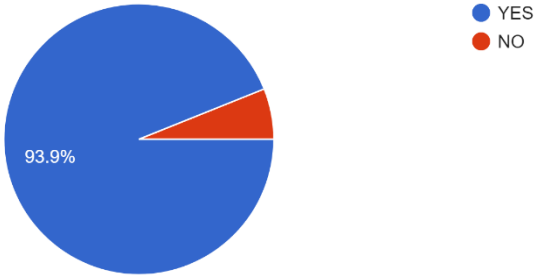
QUESTION 4 Are you familiar with eye detection technology for detecting driver drowsiness?

33 responses



QUESTION 5 Would you be interested in using a device below that can detect microsleep episodes based on eye detection technology?

33 responses

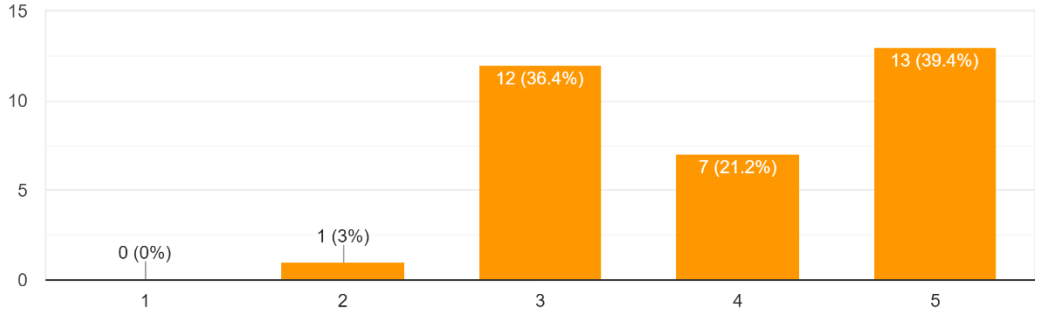


QUESTION 6 How important do you think it is to have a system that can detect driver drowsiness and prevent accidents?

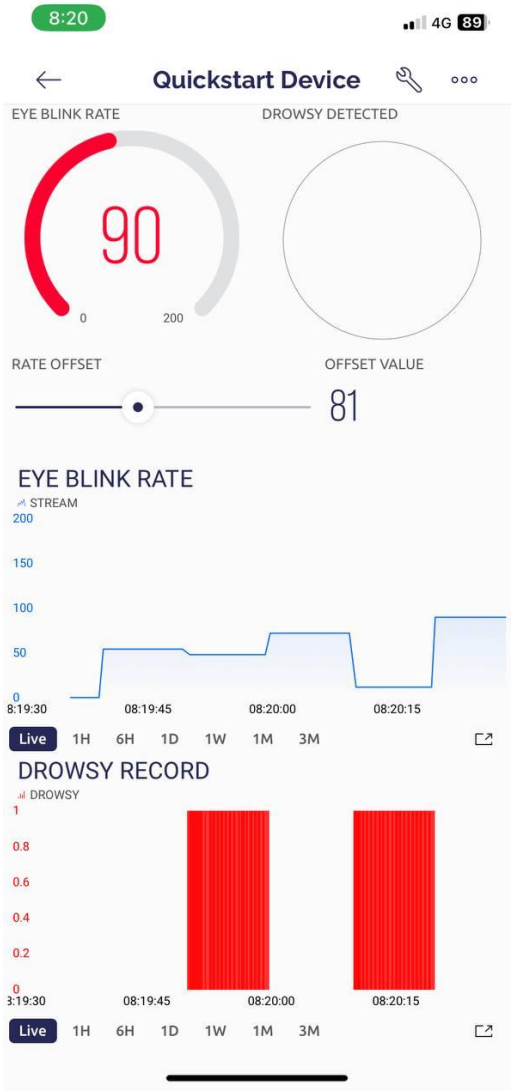
33 responses

How willing would you be to pay for a device or system that can detect and prevent microsleep episodes while driving?

33 responses



Result


8:20
4G 89
Quickstart Device
EYE BLINK RATE
DROWSY DETECTED
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RATE OFFSET
OFFSET VALUE
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EYE BLINK RATE
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8:19:30
08:19:45
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Live 1H 6H 1D 1W 1M 3M
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DROWSY
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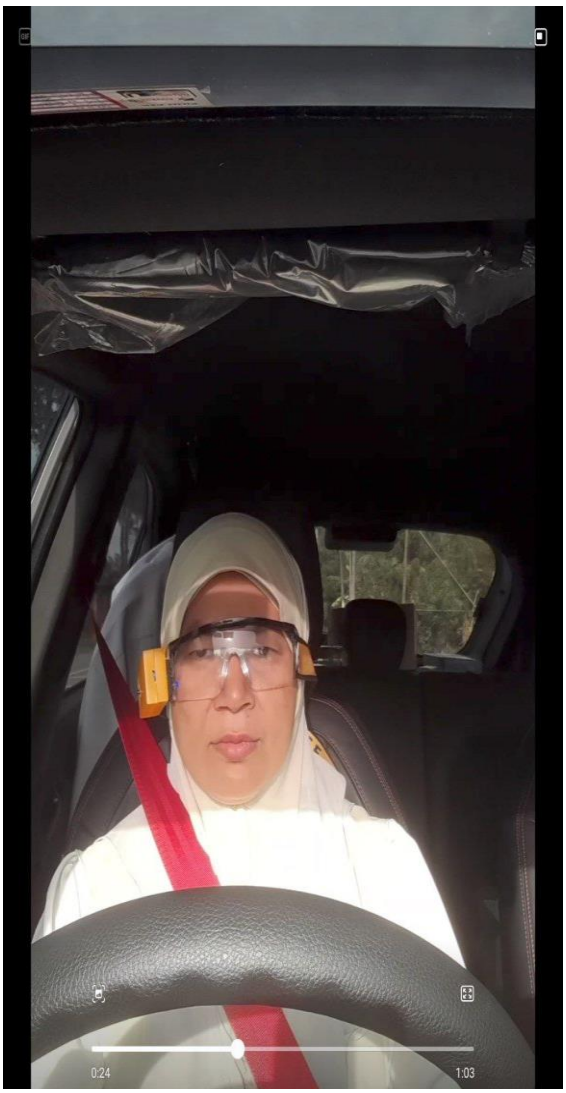
0
3:19:30
08:19:45
08:20:00
08:20:15
Live 1H 6H 1D 1W 1M 3M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1:03

4.3 Discussion

The purpose of this endeavor is to detect microsleep before it happens by keeping a watch on the driver's eye blinks. The LDR sensor will be inserted in the driver's glasses so that the Blynk app can measure how frequently the driver's eyes blink. After that, the driver must adjust the offset rate in line with the value of the eye blink rate. There is an LED on the glasses so that the LDR sensor can detect the light reflected off the cornea of the eye. If the driver's eye blinks start to weaken and become less frequent relative to the rate value, the LDR sensor can identify the beginning of microsleep. As a result, the buzzer and vibration system will activate, alerting the driver to refocus on driving or to stop and take a break. It is possible to recharge this device for further use. As it charges, the red LED will illuminate. When the charge is finished, the LED will turn blue. Drivers can also review their driving data on the Blynk app. The Blynk app will display a graph of their blinks.

4.4 Chapter Summary

In conclusion, the result and analysis chapter is a crucial component of any research study or analytical report. It presents the findings derived from the data analysis process and provides a comprehensive interpretation. This section plays a vital role in drawing meaningful conclusions, identifying patterns, and gaining insights into the research objectives. By following rigorous analytical procedures and ensuring accurate interpretation, researchers and analysts contribute to the advancement of knowledge and inform decision-making processes in their respective fields.

CHAPTER 5

5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this section, it is for explore the importance of a strong conclusion and well-founded recommendations, discussing their role in creating a lasting impact on the reader and providing a sense of closure to the work at hand. It also highlight key elements to consider when crafting a conclusion and how to develop effective recommendations based on the findings presented in the preceding sections.

5.2 Conclusion

The conclusion for this project are:

1. To develop a device that can aid drivers in maintained concentration while driving.
2. To signal the driver to resume concentration on his driving after a microsleep.
3. To lessen the chance of microsleep-related auto accidents.

5.3 Suggestion for Future Work

The development of a microsleep detector using eye blinking has shown promising potential in identifying episodes of involuntary sleep during wakefulness. However, further research and advancements are needed to enhance the accuracy, reliability, and practicality of such a detection system.

One avenue for future work is the refinement of the detection algorithm. Currently, most microsleep detection algorithms rely solely on eye blink patterns. However, integrating additional physiological or behavioral indicators, such as changes in heart rate, brain activity, or facial expressions, could improve the overall accuracy and effectiveness of the detector. By considering a wider range of indicators, the system

may be able to better differentiate between genuine microsleep episodes and other factors that can cause eye blinking, such as fatigue or eye irritation.

Another important area for future research is the development of portable and non-intrusive microsleep detection devices. Current eye-tracking technologies used in microsleep detection systems often require bulky equipment or specialized headsets, limiting their practicality for real-world applications. Advancements in miniaturized eye-tracking sensors or wearable devices could enable the integration of microsleep detection capabilities into everyday gadgets such smartwatches or even smartphones. This would make the detection system more accessible and convenient for users in various contexts, such as transportation, healthcare, or high-stress work environments.

Additionally, the validation and testing of the microsleep detector in different real-world scenarios and populations are crucial. Conducting studies in diverse settings, such as during driving simulations, in shift work environments, or with individuals suffering from sleep disorders, can provide valuable insights into the detector's performance and its ability to accurately detect microsleep episodes in various contexts. Moreover, considering individual differences, such as age, gender, and cultural factors, can help refine the detector's algorithms to account for potential variations in eye blink patterns and sleep-related behaviors.

Furthermore, conducting longitudinal studies to evaluate the long-term effectiveness and reliability of the microsleep detector is essential. Monitoring individuals over extended periods and assessing the consistency of the detector's performance in detecting microsleep episodes can provide insights into its practical application and potential benefits in mitigating the risks associated with microsleep-related accidents or errors.

In conclusion, the future work for a microsleep detector using eye blinking involves refining the detection algorithms, developing portable and non-intrusive devices, validating the system in various real-world scenarios, and conducting longitudinal studies. These advancements will contribute to the overall accuracy, reliability, and practicality of the detector, enabling its widespread adoption and potential in preventing microsleep-related incidents and improving safety in various domains.

5.4 Chapter Summary

For all academic and professional works, the conclusion and recommendation chapter acts as the capstone. It provides a succinct summary of the study's findings by bringing together the key points and conclusions. The reader can proceed with a clear knowledge of the implications of the research thanks to the suggestions, which provide helpful advice for potential future actions or considerations. The writer can make a lasting impression and increase understanding of the subject at hand by developing a well-structured and informative conclusion and recommendation section.

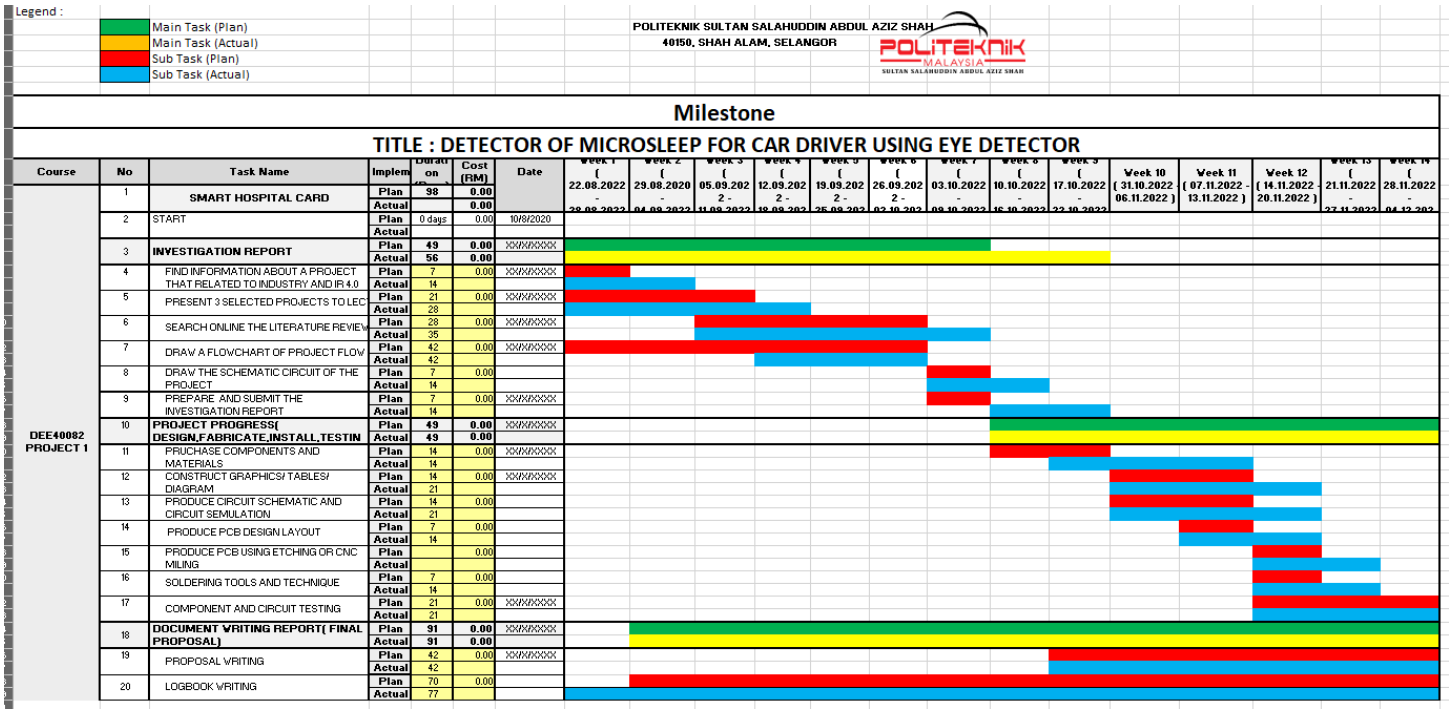
CHAPTER 6

6 PROJECT MANAGEMENT AND COSTING

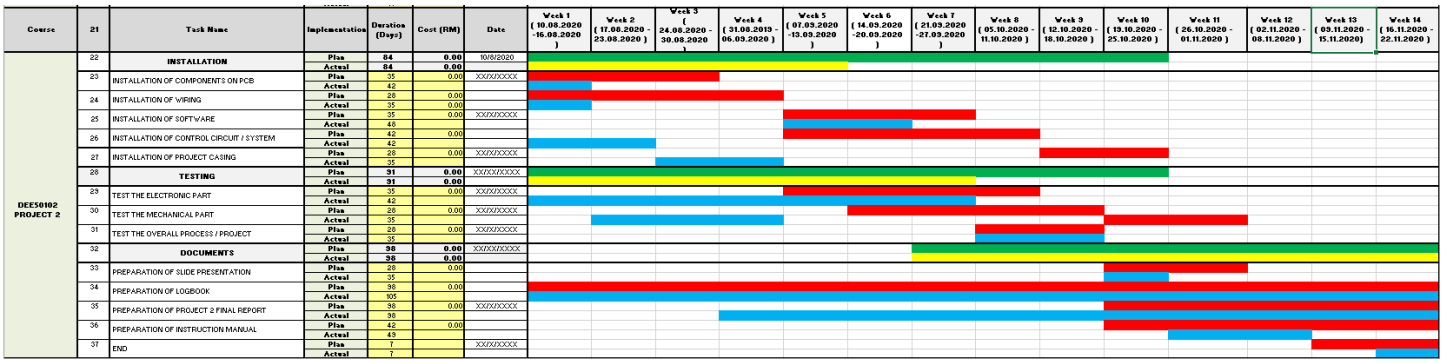
6.1 Introduction

This project involves the cost of purchasing components and materials throughout its implementation components involving cost are hardware. Most of the hardware components are got from online purchase. Before buying the component,a survey was made into several online shops to compare prices, such as Shopee, Lazada and RS Component. This method makes it easier as well because it will save time and costs. Additionally, this chapter covers weekly progress as shown in the ghantt chart.

6.2 Gant Chart and Activities of the Project



Course	No	Task Name	Implementation	Duration (Days)	Cost (RM)	Date
DEE40082 PROJECT 1	1	SMART HOSPITAL CARD	Plan	98	0.00	
			Actual		0.00	
	2	START	Plan	0 days	0.00	10/8/2020
			Actual			
	3	INVESTIGATION REPORT	Plan	49	0.00	XXXXXXXX
			Actual	56	0.00	
	4	FIND INFORMATION ABOUT A PROJECT THAT RELATED TO INDUSTRY AND IR 4.0	Plan	7	0.00	XXXXXXXX
			Actual	14		
	5	PRESENT 3 SELECTED PROJECTS TO LEC	Plan	21	0.00	XXXXXXXX
			Actual	28		
	6	SEARCH ONLINE THE LITERATURE REVIEW	Plan	28	0.00	XXXXXXXX
			Actual	35		
	7	DRAW A FLOWCHART OF PROJECT FLOW	Plan	42	0.00	XXXXXXXX
			Actual	42		
	8	DRAW THE SCHEMATIC CIRCUIT OF THE PROJECT	Plan	7	0.00	
			Actual	14		
	9	PREPARE AND SUBMIT THE INVESTIGATION REPORT	Plan	7	0.00	XXXXXXXX
			Actual	14		
	10	PROJECT PROGRESS(DESIGN,FABRICATE,INSTALL,TESTIN	Plan	49	0.00	XXXXXXXX
			Actual	49	0.00	
	11	PRUCHASE COMPONENTS AND MATERIALS	Plan	14	0.00	XXXXXXXX
			Actual	14		
	12	CONSTRUCT GRAPHICS/ TABLES/ DIAGRAM	Plan	14	0.00	XXXXXXXX
			Actual	21		
	13	PRODUCE CIRCUIT SCHEMATIC AND CIRCUIT SEMULATION	Plan	14	0.00	
			Actual	21		
	14	PRODUCE PCB DESIGN LAYOUT	Plan	7	0.00	
			Actual	14		
	15	PRODUCE PCB USING ETCHING OR CNC MILING	Plan		0.00	
			Actual			
	16	SOLDERING TOOLS AND TECHNIQUE	Plan	7	0.00	
			Actual	14		
	17	COMPONENT AND CIRCUIT TESTING	Plan	21	0.00	XXXXXXXX
			Actual	21		
	18	DOCUMENT WRITING REPORT(FINAL PROPOSAL)	Plan	91	0.00	XXXXXXXX
			Actual	91	0.00	
	19	PROPOSAL WRITING	Plan	42	0.00	XXXXXXXX
			Actual	42		
	20	LOGBOOK WRITING	Plan	70	0.00	
			Actual	77		



Course	21	Task Name	Implementation	Duration (Days)	Cost (RM)	Date
DEE50102 PROJECT 2	22	INSTALLATION	Plan	84	0.00	10/8/2020
			Actual	84	0.00	
	23	INSTALLATION OF COMPONENTS ON PCB	Plan	35	0.00	XXXXXXXX
			Actual	42		
	24	INSTALLATION OF WIRING	Plan	28	0.00	
			Actual	35	0.00	
	25	INSTALLATION OF SOFTWARE	Plan	35	0.00	XXXXXXXX
			Actual	48		
	26	INSTALLATION OF CONTROL CIRCUIT / SYSTEM	Plan	42	0.00	
			Actual	42		
	27	INSTALLATION OF PROJECT CASING	Plan	28	0.00	XXXXXXXX
			Actual	35		
	28	TESTING	Plan	91	0.00	XXXXXXXX
			Actual	91	0.00	
	29	TEST THE ELECTRONIC PART	Plan	35	0.00	XXXXXXXX
			Actual	42		
	30	TEST THE MECHANICAL PART	Plan	28	0.00	XXXXXXXX
			Actual	35		
	31	TEST THE OVERALL PROCESS / PROJECT	Plan	28	0.00	XXXXXXXX
			Actual	35		
	32	DOCUMENTS	Plan	98	0.00	XXXXXXXX
			Actual	98	0.00	
	33	PREPARATION OF SLIDE PRESENTATION	Plan	28	0.00	
			Actual	35		
	34	PREPARATION OF LOGBOOK	Plan	98	0.00	
			Actual	105		
	35	PREPARATION OF PROJECT 2 FINAL REPORT	Plan	98	0.00	XXXXXXXX
			Actual	98		
	36	PREPARATION OF INSTRUCTION MANUAL	Plan	42	0.00	
			Actual	49		
	37	END	Plan	7		XXXXXXXX
			Actual	7		

6.3 Milestone

DESCRIPTION	DATE	CUMULATIVE PROJECT COMPLETION PERCENTAGE (%)
Completion of project planning.	11/12/2022	40%
Completion of model system.	11/05/2023	100%
Completion of project management and finance	5/11/2022	70%
Completion final proposal report and project presentation	1/6/2022	100%

6.4 Cost and Budgeting

This project involves the cost of purchasing components and materials throughout its implementation components involving cost are hardware. Most of the hardware components are got from online purchase. Before buying the component,a survey was conducted into several online shops to compare prices, such as Shopee, Lazada and RS Component. This method makes it easier as well because it will save time and costs.

The overall gross budget estimate in the implementation of this project is RM 500 and other expenses is at RM 265.34 as shown in Table below according to this budget cost, this project is can be considered as a less costly project compared to other projects that can cost over a thousand ringgit. The cost of the project is also in line with one of the key features of a good project developer that is low cost but has a high-quality project.

No.	Component and materials	The unit price	Quantity	Total
1	Node MCU	RM 29.00	1	RM 29.00
2	Rechargeable Battery BL-5C Li-ion battery	RM 7.90	1	RM 7.90
3	MCHY> 2PCS 1A 5V TP4056 Lithium Charging Module USB Board Electronic Component	RM 3.16	1	RM 3.16
4	10x for DC 3V 70mA 12000±2500RPM Phone Coin Flat Vibrating Vibration Motor 10x for DC 3V 70mA 12000±2500 RPM Phone Coin Flat Vibrating Vibration Motor	RM 7.88	1	RM 7.88
5	Switch Buttons	RM 1.00	1	RM 2.00
6	Buzzer	RM 1.50	1	RM 1.50
7	LED	RM 1.00	1	RM 4.00
8	Safety Glasses	RM 9.90	1	RM 9.90
9	Belt	RM 5.00	1	RM 5.00
8	Other materials	RM 45	-	RM 45.00
			Total :	**RM 115.34**
	List of other costing			
1	Transportation			RM 20.00
2	Postage			RM 30.00
3	Craft Work			RM 25.00
4	Internet			-
5	Application			-
			Total :	**RM 75.00**
			Overall total	**RM 265.34**

6.5 Chapter Summary

In this chapter, there are includes the project management and costing. In this section, we have to make a gantt chart about the project period and also we have to list a budget and the price the component that we want to buy.

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7 APPENDICES

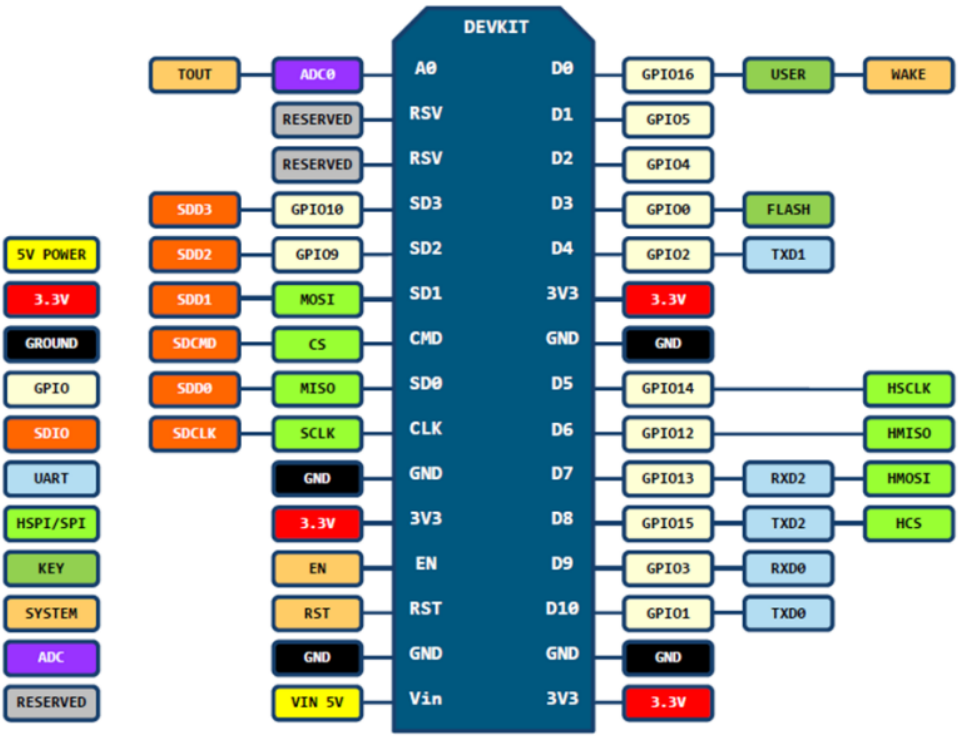
APPENDIX A- DATA SHEET

ESP8266 NodeMCU WiFi Development Board

The ESP8266 is the name of a micro controller designed by Espressif Systems. The ESP8266 itself is a self-contained WiFi networking solution offering as a bridge from existing micro controller to WiFi and is also capable of running self-contained applications.

This module comes with a built in USB connector and a rich assortment of pin-outs. With a micro USB cable, you can connect NodeMCU devkit to your laptop and flash it without any trouble, just like Arduino. It is also immediately breadboard friendly.

2. Pin Definition:



ESP8266 Pin	Description
CH_PD	Pull high, connect to Vcc +3.3V
Vcc	Power Supply +3.3V
TXD	Connect to RXD (white) of PL2303HX USB-Serial converter cable
RXD	Connect to TXD (Green) of PL2303HX USB-Serial converter cable
GPIO0	Pull low, connect to GND pin
GND	Power Supply ground

APPENDIX B- PROGRAMMING

```
// Template ID, Device Name and Auth Token are provided by the
Blynk.Cloud
// See the Device Info tab, or Template settings
#define BLYNK_TEMPLATE_ID           "TMPL6Z2spPQ0K"
#define BLYNK_TEMPLATE_NAME         "Quickstart Template"
#define BLYNK_AUTH_TOKEN            "7lJEbCE1nRrwZWNaBCy9tm16VPVGkm35"


// Comment this out to disable prints and save space
#define BLYNK_PRINT Serial


#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>


#define IR D3
#define Buzzerx D7
#define Vib D8


char auth[] = BLYNK_AUTH_TOKEN;
float Sens1;
// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "DROWSY";
char pass[] = "12345678";


int DROWSY=0;
int BRSET=50;
int Beat=0;
int Timer=0;
int Timer1=0;
int Timer2=0;
float BlinkRate=0;
float LDR;
float OldLDR=0;
```

```
int MODE=0;
int TF=0;
int TS=0;

int MDD=0;
int Rly1=0, Rly2=0, Rly3=0, Rly4=0, Rly5=0, Rly6=0,  Rly7=0,  Rly8=0;
int Val1=90, Val2=0, Val3=0, Val4=0, Val5=0, Val6=0,  Val7=0,  Val8=0;
int COUNTER=0;
int AL1=0,AL2=0,AL3=0;
int TM=0;
BlynkTimer timer;
int DCOUNT=0;
int pos=0;
bool led_set[2];
long timer_start_set[2] = {0xFFFF, 0xFFFF};
long timer_stop_set[2] = {0xFFFF, 0xFFFF};
unsigned char weekday_set[2];

long rtc_sec;
unsigned char day_of_week;

bool led_status[2];
bool update_blynk_status[2];
bool led_timer_on_set[2];
float FORCE=0;

// This function is called every time the Virtual Pin 0 state changes


// This function is called every time the device is connected to the
Blynk.Cloud
BLYNK_CONNECTED()
{

}

// This function sends Arduino's uptime every second to Virtual Pin 2.
void myTimerEvent()
{

  Sens1 = analogRead(A0);
Sens1 = (5.0 * Sens1 * 100.0)/1024.0;
LDR=Sens1;

//&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
//-----------------------------------
if (MODE==0){
  TF++;
  if (TF>=2){
```

```
    TS++;
    TF=0;
  }

  if (TS>=10){
    MODE=1;
    OldLDR=LDR;
    TS=0;
  }

}

if (MODE==1){
   TF++;
  if (TF>=2){
    TS++;
    TF=0;
  }


  float LDRx=LDR+1.5;
  float LDRm=LDR-1.5;
  if (OldLDR>LDRx || OldLDR<LDRm){
    Beat++;
    OldLDR=LDR;
  }

  if (TS>=10){
    Serial.println("Calculate Blink rate...");
    BlinkRate=Beat/10.0*60;
    TS=0;
    Beat=0;

    if (BlinkRate>0 && BlinkRate<BRSET){
      digitalWrite(Vib,HIGH);
      digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(10);
digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(10);
      digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(10);
digitalWrite(Buzzerx,HIGH);
delay(10);
```

```
digitalWrite(Buzzerx,LOW);
delay(10);
      digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(10);
digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(10);
      digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(10);
digitalWrite(Buzzerx,HIGH);
delay(10);
digitalWrite(Buzzerx,LOW);
delay(300);
digitalWrite(Vib,LOW);
 Serial.println("DROWSY DETECTED!!!");
 DROWSY=1;
    }

    if (BlinkRate>BRSET){
      DROWSY=0;
    }
  }
}



Serial.print(Sens1);
Serial.print("\t");
Serial.print(BlinkRate);
Serial.print("\t");
Serial.println(TS);

  //*************************************************


Blynk.virtualWrite(V0, BlinkRate);
Blynk.virtualWrite(V1, BRSET);
Blynk.virtualWrite(V2, DROWSY);
}

BLYNK_WRITE(V10)
{
  Rly1 = param.asInt(); // assigning incoming value from pin V1 to a
variable
```

```
  if (Rly1==1){

  }


  // process received value
}

BLYNK_WRITE(V7)
{
  Rly7 = param.asInt(); // assigning incoming value from pin V1 to a
variable

  if (Rly7==1){
                            // waits 15ms for the servo to reach the
position
  }
   // Blynk.logEvent("manual", String("MESSAGE"));


  // process received value
}


BLYNK_WRITE(V2)
{
  Rly2 = param.asInt(); // assigning incoming value from pin V1 to a
variable

  if (Rly2==1){

  delay(500);

  }

  // process received value
}


BLYNK_WRITE(V5)
{
  Rly5 = param.asInt(); // assigning incoming value from pin V1 to a
variable

  if (Rly5==1){

  }
  if (Rly5==0){
```

```
  }

  // process received value
}

BLYNK_WRITE(V6)
{
  Rly6 = param.asInt(); // assigning incoming value from pin V1 to a
variable

  if (Rly6==1){

  }
  if (Rly6==0){

  }

  // process received value
}



BLYNK_WRITE(V1)
{
  Val1 = param.asInt(); // assigning incoming value from pin V1 to a
variable

 BRSET=Val1;
    Serial.print("");
    Serial.println(Val1);

  // process received value
}

BLYNK_WRITE(V9)
{
  unsigned char week_day;

  TimeInputParam t(param);

  if (t.hasStartTime() && t.hasStopTime() )
  {
    timer_start_set[0] = (t.getStartHour() * 60 * 60) +
(t.getStartMinute() * 60) + t.getStartSecond();
    timer_stop_set[0] = (t.getStopHour() * 60 * 60) +
(t.getStopMinute() * 60) + t.getStopSecond();

    Serial.println(String("Start Time: ") +
```

```
                  t.getStartHour() + ":" +
                  t.getStartMinute() + ":" +
                  t.getStartSecond());

    Serial.println(String("Stop Time: ") +
                  t.getStopHour() + ":" +
                  t.getStopMinute() + ":" +
                  t.getStopSecond());

    for (int i = 1; i <= 7; i++)
    {
      if (t.isWeekdaySelected(i))
      {
        week_day |= (0x01 << (i-1));
        Serial.println(String("Day ") + i + " is selected");
      }
      else
      {
        week_day &= (~(0x01 << (i-1)));
      }
    }

    weekday_set[0] = week_day;
  }
  else
  {
    timer_start_set[0] = 0xFFFF;
    timer_stop_set[0] = 0xFFFF;
  }
}

//
################################################################################
###################################

void setup()
{



  pinMode(Buzzerx,OUTPUT);
  pinMode(Vib,OUTPUT);
  pinMode(IR,INPUT);


  Serial.begin(9600);
  digitalWrite(Buzzerx,HIGH);
  delay(20);
```

```
  digitalWrite(Buzzerx,LOW);
  delay(20);
  digitalWrite(Buzzerx,HIGH);
  delay(20);
  digitalWrite(Buzzerx,LOW);
  delay(20);
  digitalWrite(Buzzerx,HIGH);
  digitalWrite(Vib,HIGH);
  delay(20);
  digitalWrite(Buzzerx,LOW);
  delay(20);
  digitalWrite(Vib,LOW);

  Blynk.begin(auth, ssid, pass);
  // You can also specify server:
  //Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);
  //Blynk.begin(auth, ssid, pass, IPAddress(192,168,1,100), 8080);

  // Setup a function to be called every second
  timer.setInterval(500L, myTimerEvent);

}

void loop()
{
  Blynk.run();
  timer.run();



}
```