

# **Anti-Sleep Glass for Driving**

**BY**

**Sumia Ahmed**  
**ID: 183-15-12016**

**Humira Ahmed**  
**ID: 183-15-12017**

**Project ID: SM21D085**

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of  
Science in Computer Science and Engineering

Supervised By

**Md. Abbas Ali Khan**  
Assistant Professor  
Department of CSE  
Daffodil International University



**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

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## APPROVAL

This Project titled “**Anti-sleep glass for driving**”, submitted by “**Sumia Ahmed, Id No: 183-15-12016 & Humira Ahmed, Id No: 183-15-12017**” to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents.

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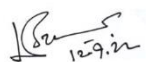
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Department of CSE  
Faculty of Science & Information Technology  
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Institute of information Technology  
Jahangirnagar university.

**External Examiner**

## DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md.Abbas Ali Khan, Department of CSE** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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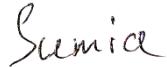
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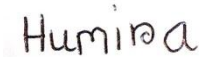
**Submitted by:**

Handwritten signature of Sumia Ahmed.

---

**Sumia Ahmed**

ID: 183-15-12016  
Department of CSE  
Daffodil International University

Handwritten signature of Humira Ahmed.

---

**Humira Ahmed**

ID: 183-15-12017  
Department of CSE  
Daffodil International University

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Finally, I must express my gratitude for my parents' and my siblings' unwavering support and patience.

## **ABSTRACT**

A temporary condition that distinguishes a state between consciousness and sleep is drowsiness. One of the main contributing factors to all accidents worldwide is driver weariness. One of the best ways to gauge driver weariness is by observing the driver's level of sleepiness. In this project, we want to create a drowsiness detection system prototype. This technology detects driving drowsiness by tracking the driver's eyes and vibrating and emitting an alarm. The system is intended to be a real-time monitoring system that is not obtrusive. The emphasis is on making the driver and passengers in the car safer without being intrusive. In this project, a sensor picks up the driver's eye blink. Drivers are considered to be drowsy and are awakened and warned by an alert that sounds and vibrates if their eyes are closed for an extended amount of time. The face feature detection for this is programmed using the Haarcascade package in OpenCV (Open Source Computer Vision). The idea behind the suggested system in this work, which makes use of the OpenCV library, is to use real-time facial image analysis to alert drivers when they are falling asleep or not paying attention, hence reducing the risk of accidents. Under various operating circumstances, the suggested system's effectiveness as a sleepiness warning system is assessed. In order for the expert system to function well, we are attempting to obtain the experimental outcomes is increasing safety in driving.

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# Chapter 1

## Introduction

1.1. **Introduction:** Driver fatigue is a major factor in a large number of road accidents. Recent statistics estimate that every year 1,800 deaths and 96,000 injuries can be attributed to fatigue-related accidents. The Global Road Safety Report provided by WHO, which reflects information from about 180 countries, indicates that the total number of road deaths worldwide has reached a high of 1.25 million people per year, with India reporting around 1.34 lakh deaths from road accidents each year. , 70% of which is due to drowsiness. The development of technology to detect or prevent drowsiness while driving is a major challenge in the field of crash prevention systems. Because of the danger that drowsiness presents on the road, methods must be developed to counteract its effects. The goal of this project is to develop a prototype drowsiness detection system. The focus will be on designing a system that accurately tracks the opening or closing of the driver's eyes in real time. By tracking the eyes, it is believed that the symptoms of driver fatigue can be detected early to avoid car accidents. Fatigue detection involves observing eye movements and flicker patterns in a sequence of images of a face. It will also send an alert to the owner that the driver is drowsy. The problem of driver distraction can also be solved with this project as it will detect the movement of the driver's eyeballs and let him know that he is not looking ahead and an alert will be triggered. activated to stop the vehicle. This work focuses on determining the position of the eyes, which involves looking at the whole image of the face and determining the position of the eyes, using a well-recommended image processing algorithm. Once the position of the eyes is determined, the system is designed to determine whether the eyes are open or closed, and detect fatigue. For our project, face and eye classifier is needed. So we used the learning object method to generate our own haar classifier files. If detected, an alert will be sent to both the driver and the vehicle owner and an alarm will sound to wake the driver up asking them to stop and take rest.

## **1.2.Purpose:**

Car accidents are the leading cause of death, with about 1.3 million deaths each year. The majority of these accidents are caused by driver distraction or falling asleep. The construction of highways has reduced the error rate of drivers. Countless people travel long distances every day and night on the highways. Lack of sleep or distractions like making phone calls, talking to passengers, etc. may cause an accident. Drowsy drivers mainly depend on:

- (i) the quality of the final sleep;
- (ii) circadian rhythms (time of day) and,
- (iii) increased driving time. In some research experiments, subjects were completely sleep deprived, while in others they were only partially sleep deprived. In addition, some researchers recruited night workers as subjects; in these cases, the subjects were completely sleep deprived because the experiments were conducted in the morning.

To prevent such accidents, we provide a system that warns the driver if he is distracted or feels drowsy. Facial landmark detection is used by processing images of facial images captured by the camera, to detect distraction or drowsiness. The entire system is implemented on mobile hardware that can be easily installed on the vehicle for use.

## **1.3 Motivations and Scope:**

Drowsy driving is an important factor in the increasing number of accidents on today's roads and is widely accepted. This evidence has been verified by many researchers who have demonstrated a link between drowsy driving and road accidents. While it is difficult to pinpoint the exact number of accidents caused by dozing off, it is most likely underestimated. The above statement underscores the importance of research aimed at minimizing the risk of predictable drowsy accidents. So far, researchers have tried to model behavior by linking sleepiness to a number of cues related to vehicles and drivers. Previous sleep detection methods mainly made presuppositions about the behavior involved, focusing on the frequency of blinking, eye closing, and yawning. The auto industry has also attempted to build a number of systems to predict driver drowsiness, but there are only a few commercial products available today. The systems don't consider the driver's performance and ignore the driver's abilities and characteristics. Naturally, most people would agree that different people drive differently. The system is being developed that can adapt to changes in the driver's behavior.

1. This project can be implemented as a mobile application to reduce hardware costs.

2. This project can be integrated into the car, so that the automatic speed control can be transmitted if the driver is asleep.

**1.4 Objective:** In this work, our main goal was to build a model that can identify a driver's drowsiness and warn him to take a break, today AI has become a popular technique for detecting feeling. In this work, we use CNN model with an algorithm, we train our model using data set to identify tomato species perfectly.

**1.5 Expected Outcome:** A large number of accidents happen around the world due to drowsy and drowsy driving. Everyone has no opinion. With this project, we wanted to help people overcome this drowsy driving problem. So thanks to this project, everyone will benefit from solving this problem, helping those who are victims of road traffic accidents.

## Chapter 2

### Background

**2.1 Related Work:** Despite the fact that there is some work related to this but they were not the as handy as ours. one of the most advance one is,

- i. Driver Sleep recognition and alarm system:** This system is most recongnized one among the related work that have been done. This project use camera setup in car which will detect the eye blinking of the driver, But there is some backlog of this project that if there is multiple person in front of camera then the camera gets puzzled which is why this is defined as the backlog of the project.[1]

## Chapter 3

### Future Scope

**3.1 Future scope:** In this part, we made our project as a prototype. In the future we will make our project using micro technology that will simplify our project and will be easier to transport and carry around at all times.

A good example of mass production is the rattle alarm system of a passenger car. Vehicle wobble alarms have been installed on trucks and buses like the dryer of hino's selega, mazda has produced a lot of passenger cars that catch the attention of wary drivers. The system is activated at about 65 km/h and begins to teach the driver his routine. Then, when it detects a change in vehicle behavior indicating distraction while driving, it prompts the driver to take a break through information from the human machine interface. The cars are equipped with a driver's attention monitor. It uses the power conduit to measure the frequency and level of the driver's string inputs to gauge the driver's level of awareness. The volvo system also uses lane information from the camera. Jaguar's Driver Condition Monitor uses wheel performance as well as brake and throttle movements. There are two detection methods: one using the vertical angle sensor and the other using the camera to detect the lane. The method based on driving behavior can estimate the driver's level of arousal without the driver's knowledge, but it can quickly measure the increase in error due to bad weather or markings. extra sense, it's only useful when the driver is holding the steering wheel.

## Chapter: 4

### Requirement analysis and design

#### 4.1 Required components:

The components that were required in this project are,

1. Arduino Pro Mini 328 (5V/16MHz)
2. IR Sensor Module FC-51
3. Buzzer
4. Vibrator Motor
5. Transistor BC547-NPN
6. Resistor
7. Battery
8. Voltage Regulator-7805

#### 4.2 Brief of components:

4.2.1. Arduino Pro Mini 328 (5V/16MHz):



Fig 4.1: Arduino Pro Mini 328 (5V/16MHz)



Fig 4.2: Arduino Pro Mini 328 (5V/16MHz)

#### 4.2.1.1. Description of arduino pro mini 328 (5v/16MHz):

This is a 5V Arduino running the 16MHz bootloader. Arduino Pro Mini does not come with connectors populated so that you can solder in any connector or wire with any orientation you need.[1]

#### 4.2.1.2. Work of arduino pro mini 328( 5v/16MHz):

The Arduino Pro Mini is designed for semi-permanent installation in objects or exhibits. The board is delivered without pre-assembled headers, allowing the use of different connector types or direct soldering of wires. The pin layout is compatible with the Arduino Mini. There are two versions of the Pro Mini.

#### 4.2.2. IR sensor module FC-21:



Fig 4.3:IR sensor

##### 4.2.2.1: Description of IR sensor Fc-21:

Infrared sensors are widely used today in motion detectors, used in building services to turn on lights, or in alarm systems to detect unwanted visitors. Within a defined range of angles, the sensing elements detect thermal radiation (infrared radiation) that varies in time and space due to human movement..[3]

##### 4.2.2.2:Work of IR sensor FC-21:

The active infrared sensor both emits and detects infrared radiation. The active IR sensor consists of two parts: a light emitting diode (LED) and a receiver. When an object approaches the sensor, the infrared light from the LED is reflected off the object and detected by the receiver.[4]

#### 4.2.3: **Buzzer:**



Fig 4.4: Buzzer

##### 4.2.3.1: **Description of Buzzer:**

A whistle or beep is an audio signal device, which can be mechanical, electromechanical or piezoelectric (referred to as piezo). Typical applications for whistles and beeps include alarms, timers, trains, and confirmation of user input such as mouse clicks or key presses or any sensor detection.

##### 4.2.3.2: **Work of Buzzer:**

When a potential difference is applied to the ends of two electrodes, the piezoelectric object is mechanically deformed due to the applied potential difference. This movement of the piezo disc inside the vibrator produces the same sound as that of the ferromagnetic disc in the magnetic vibrator or speaker cone mentioned above.

#### 4.2.4:Vibrator Motor:



Fig 4.5: Vibrator Motor

##### 4.2.4.1:Description of Vibrator Motor:

The vibration motor is a compact sized coreless DC motor used to notify the user to receive a signal by vibration, without sound. Vibration motors are widely used in many applications including mobile phones, handheld devices, pagers, etc.

#### 4.2.4.2: Work of Vibrator Motor:

The vibration motor is a coreless DC motor, and the size of this motor is compact. The main purpose of this engine is to warn the user to receive a call without sound/vibration. These motors are applicable to different applications like pagers, hand-held devices, mobile phones, etc.

#### 4.2.5: Transistor BC547-NPN:

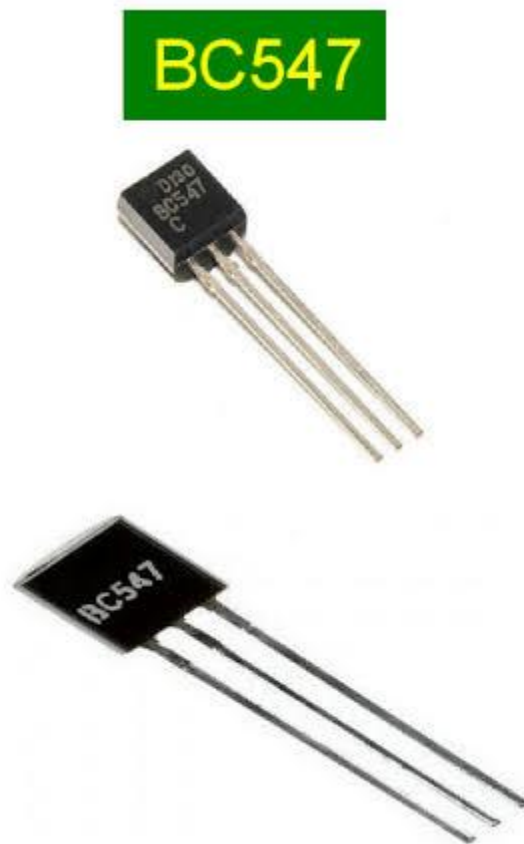


Fig 4.6: Transistor BC547-NPN

##### 4.2.5.1: Description of Transistor BC547-NPN:

The BC547 is an NPN transistor, which means when power is applied to the base (control pin) it goes from collector to emitter. Typically, NPN transistors are used to "switch to ground" on a device, which means they are placed after the load in the circuit.

##### 4.2.5.2: Work of Transistor BC547-NPN:

BC547 is commonly used as a current amplifier, fast switching and pulse width modulation (PWM).

Therefore, if you need to control the speed of a motor or an actuator in any project, anyone can simply use this transistor to achieve it.

#### 4.2.6: **Resistor:**



Fig 4.7:Resistor

##### 4.2.6.1: **Description of Resistor:**

Resistor is known as a two-terminal passive electrical component that limits or regulates the flow of charge in an electrical circuit. The main purpose of a resistor is to reduce current and voltage drop in a particular part of a circuit.

##### 4.2.6.2: **Work of Resistor:**

A resistor is a two-terminal passive electrical component that implements resistance as an element of a circuit. In electronic circuits, resistors are used for current reduction, signal level regulation, voltage division, polarization active elements, and line termination, among other uses.

#### 4.2.7: **Battery:**



Fig 4.8: Battery

#### 4.2.7.1: Description of Battery:

A battery is a device that directly converts chemical energy contained in active materials into electrical energy through an electrochemical oxidation-reduction (redox) reaction. This type of reaction involves the transfer of electrons from one material to another through an electrical circuit.

#### 4.2.7.2: Work of Battery:

A battery is an electrical device that stores chemical energy and converts it into electrical energy for storage. Chemical reactions in batteries involve the flow of electrons from one material (electrode) to another, through an external circuit. The flow of electrons provides an electric current that can be used to save energy and get work done.

#### 4.2.8. Voltage Regulator 7805:

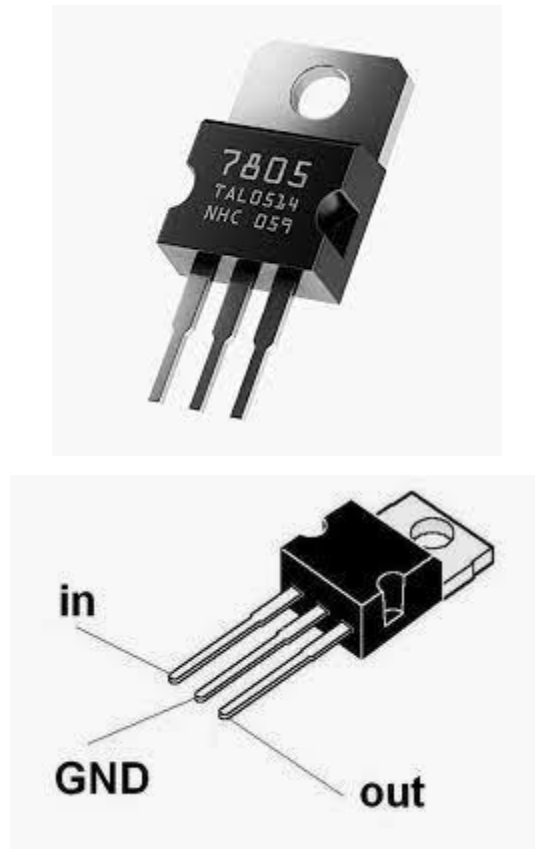


Fig 4.9: Voltage regulator 7805

##### 4.2.8.1: Description of Voltage regulator 7805:

The voltage regulator IC 7805 is actually a member of the 78xx series of voltage regulator ICs. It is a fixed linear voltage regulator. The xx present in 78xx represents the value of the fixed output voltage that the particular IC provides. For 7805 IC, it is +5V DC regulated power supply.

##### 4.2.8.2: Work of Voltage regulator 7805:

For 7805 IC, it is +5V DC regulated power supply. This regulator IC also adds a provision for a heat sink. The input voltage to this voltage regulator can be up to 35V, and this IC can give a constant 5V for any value of input less than or equal to 35V which is the threshold limit.

#### 4.3 Circuit Diagram:

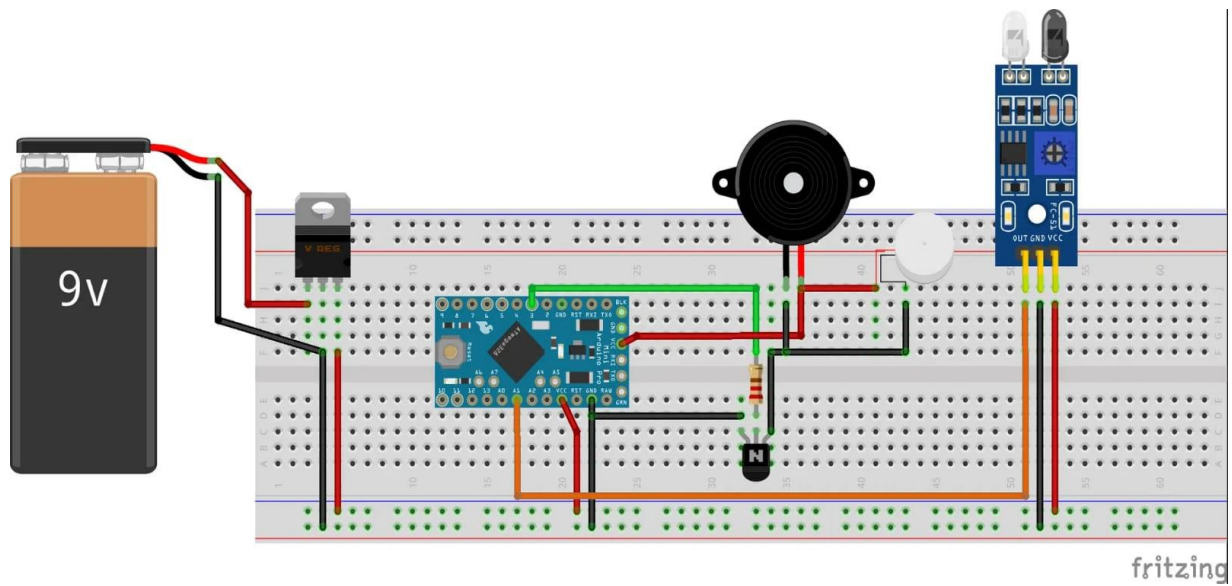


Fig 4.10:Circuit Diagram

#### 4.4. Our project look:



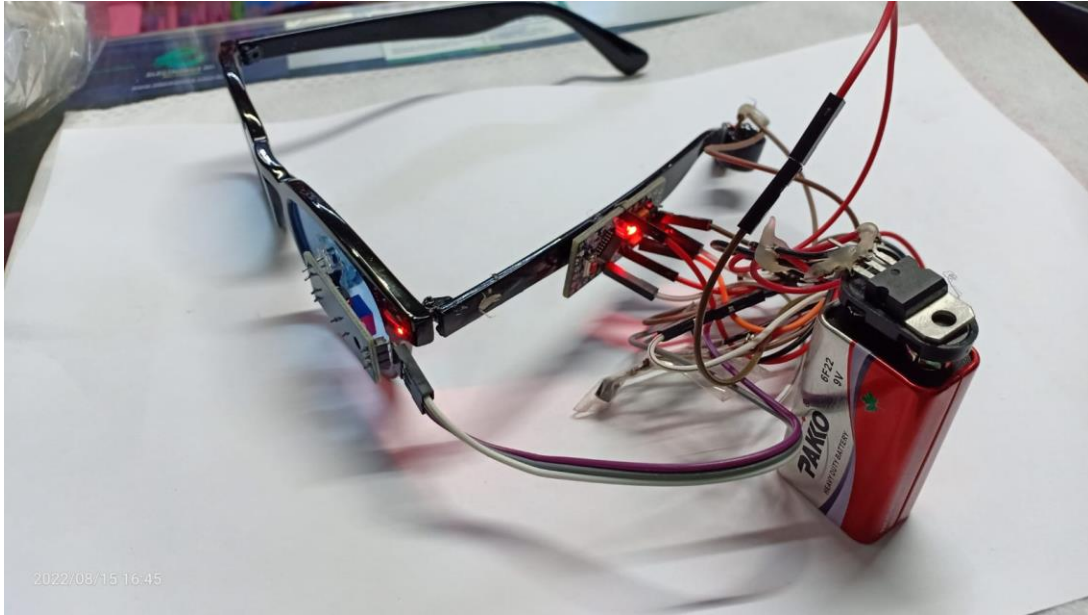


Fig 4.11: Our project looks

## Chapter 5

### Required code for our project

#### 5.1. code for the project :

As our project involves sensors and sensors need guidance and information for detection. To get the data and give feedback to the user, some code and codes are provided below,

#### Code:

```
int Sinput = A1; // assigning an int type variable for sensor input signal
int Buz=3; // assigning an int type variable for output buzz and vibrator
void setup() /// in void setup we make the selected pins output or input.
{
pinMode(Sinput, INPUT); /// here it is sensors pin so we are defining here that this pin is input
pin
pinMode(Buz, OUTPUT); /// here it is the pin used for transistor to control it, so we are
defining here that this pin is output pin
}
void loop()
{
if(digitalRead(Sinput)==LOW)
{
delay (2000); // we are waiting for two second after the input pulse from the sensor. if the
pulse is for more than 2 second then buzzer get triggered
digitalWrite(Buz, HIGH);
}
}
```

```
else
{
if(digitalRead(Sinput)== HIGH)
{
digitalWrite(Buz, LOW);
}
}
}
```

## **Chapter: 6**

### **Conclusion and References**

**6.1 Conclusion:** Road accident is one of the major hindrance and problem in the road and most of the cases it happens because of the drowsiness of the driver. To overcome this problem our anti sleep glass can help and warn the driver to take rest and get freshen up. A buzzer is used to warn the driver if the driver is drowsy. A camera of proper resolution is used to sense the movement of eyes. Although there is need for more upgrad, the proposed system can contribute effectively in detecting the driver's state and highly decrease the ratio of road accidents.

## References:

- [1] Himansu Adak “anti sleep recognition and alarm system” Galgotias university, may 2020.
- [2] B. Franklin , “Electric battery,” *Wikipedia*, 06-Sep-2022. [Online]. Available: [https://en.wikipedia.org/wiki/Electric\\_battery](https://en.wikipedia.org/wiki/Electric_battery). [Accessed: 09-Aug-2022].
- [3] D. Jost, “What is an IR sensor?,” *Fierce Electronics*, 30-Jul-2019. [Online]. Available: <https://www.fierceelectronics.com/sensors/what-ir-sensor>. [Accessed: 09-Aug-2022].
- [4] E. Y. A. L. MEHOUDAR, “Online circuit simulator,” *How to wire to Arduino Uno*, 2016. [Online]. Available: <https://www.circuito.io/app?components=512%2C11021>. [Accessed: 20-Jul-2022].
- [5] M. Power, “Voltage Regulator types and working principle: Article: Mps,” *Voltage Regulator Types and Working Principle / Article / MPS*, 2017. [Online]. Available: <https://www.monolithicpower.com/en/voltage-regulator-types>. [Accessed: 08-Aug-2022].
- [6] R. Bd, “BC547 NPN transistor,” *RoboticsBD*, 2019. [Online]. Available: <https://store.roboticsbd.com/components/758-bc547-npn-transistor-robotics-bangladesh.html>. [Accessed: 10-Aug-2022].
- [7] T. A. Team, “Arduino Pro Mini: Arduino documentation,” *Arduino Documentation / Arduino Documentation*. [Online]. Available: <https://docs.arduino.cc/retired/boards/arduino-pro-mini>. [Accessed: 11-Aug-2022].
- [8] T. A. Team, “Uno R3: Arduino documentation,” *Arduino Documentation / Arduino Documentation*, 2017. [Online]. Available: <https://www.arduino.cc/en/Guide/ArduinoUno>. [Accessed: 24-Jul-2022].
- [9] T. Agarwal, “Buzzer : Working, types, circuit, Advantages & Disadvantages,” *ElProCus*, 26-Jul-2021. [Online]. Available: <https://www.elprocus.com/buzzer-working-applications/>. [Accessed: 10-Aug-2022].
- [10] *Google*. [Online]. Available: <https://www.google.com/>. [Accessed: 11-Sep-2022].

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