AUTOMATIC BRAKING SYSTEM BY USING AN IR SENSOR

[1] **Radhika More,** [2] **Rutuja Kumbhar,** [3] **Shubham Masodkar,** [4] **Ghansham Kanaye,** [5] **Prof. B Bhagyashree Niture**

[1] **BE Electrical Engineering student,** [2] **BE Electrical Engineering student,** [3] **BE Electrical Engineering student,** [4] **BE Electrical Engineering student,** [5] **Assistant Professor (MMCOE)**

---***---

Abstract -The objective is to design an Accident Prevention System by using an Automatic braking system which helps in preventing/ avoiding accidents. It has been observed that major accidents happen due to the drowsy state of the driver. when the driver is unable to control the vehicle in that state i.e., a sleepy state. By using an IR sensor, it is easy to recognize the blinking frequency or the driver. An IR-based eye blink sensor is installed in the vehicle. If the system detects the drowsy condition of the driver, then the system will give a buzzer or alarm signal and the speed of the vehicle is reduced and braking will happen. The technology, we used here is Arduino NANO, LM293D motor driver IC, and EYE BLINK SENSOR for the effective function of automatic braking systems. This complete system can be installed in the vehicle and effectively used for automatic braking of the vehicle and control.

*Key Words***:** Arduino Nano, LM293D Motor driver IC, Eye Blink Sensor, blinking frequency, IR (Infrared),

INTRODUCTION

"Driving to save lives, time, and money in spite of the conditions around you and the actions of others." This is the slogan of the Defensive Driving campaign. Inappropriate driving is the leading cause of vehicle accidents. If the driver is tired or drunk, this might happen for a variety of reasons. The focus of this paper was on vehicle accidents caused by drowsy\sleepy conditions of the driver. As the number of people killed in car accidents rises every day, the strategies listed below are being used to reduce the number of accidents. Drowsy driving has been identified as a significant contributor to automobile accidents It has been proven that increasing tiredness impairs driving ability, with the consequent crashes accounting for more than 20% of all vehicle accidents.

A life, however, cannot be restored once it has been lost. Up to a certain extent, advanced technology offers some hope in avoiding problems. Using an infrared sensor, this project measures and controls eye blink. An IR transmitter transmits infrared rays from our eyes. The eye's reflected infrared rays are received by the IR receiver. If the IR receiver output is closed i.e., closed eye, the IR receiver output is high; otherwise, the IR

receiver output is low. This is used to determine whether the eye is shutting or opening. This signal is sent to the logic circuit, which signals the alarm and braking mechanism to stop the vehicle. In this model, an eye blink sensor is installed, and if somebody loses consciousness or fell asleep, an alert is triggered and the braking mechanism will activate.

The eye blinking sensor transfers signals to Arduino nano, Arduino nano sends signals to the Dc motor driver, and according to the braking will happen and the vehicle will be stopped gradually in 2-5 sec.

1. BLOCK DIAGRAM
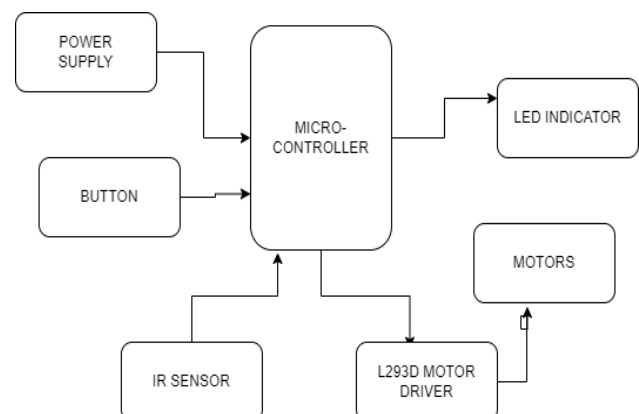
2. Flow Chart
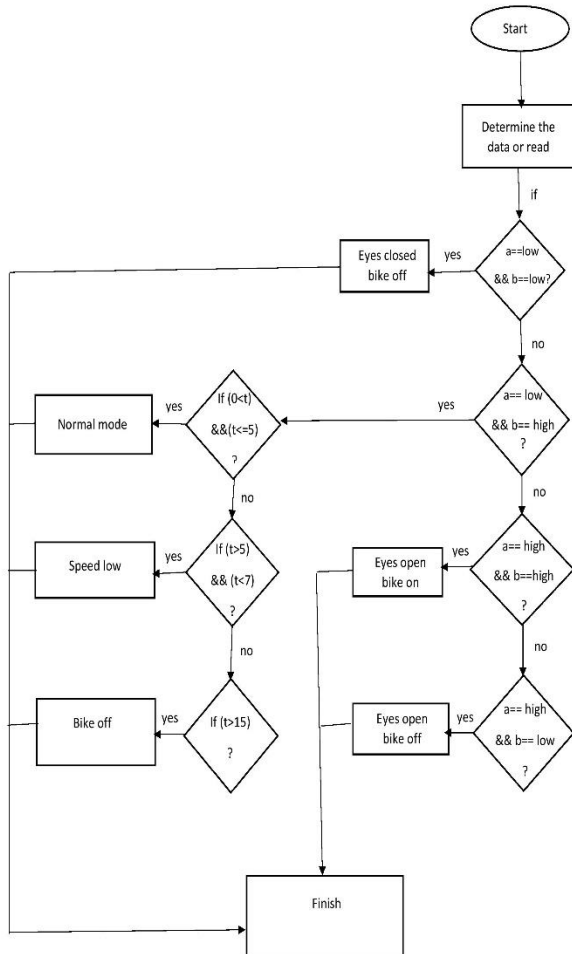
3. Algorithm

Start:

Input: Data or Read

Step 1:

if (a==low and b==low):

   eyes closed – bike off

Step 2:

else:

   if (a==low and b==high):

    if ($0<t$ and $t<=5$):

     Then – Normal Mode

Step 3:

  else:

   if ($t>5$ and $t<7$):

    Then – speed low

Step 4:

  else:

   if ($t>15$):

    Then – Bike Off

Step 5:

else:

   if (a==high and b==high):

     Then – Eyes open and Bike on

Step 6:

  else:

   if (a==high and b==low):

     Then – Eyes open and Bike Off

Finish.

4. WORKING

1. When the IR sensor senses the drowsiness of thedriver or if the driver's eyes remain closed for more than 2-5 seconds then the system sends a signal to Arduino nano

2. Then Arduino nano sends a signal to the alarm and the L293D motordriver IC which controls the BO motor.

3. Then braking will be operated and the vehicle will be stopped gradually in 2-5 sec.

5. COMPONENTS

- Arduino Nano
- IR based Eye Blink Sensor
- Buzzer
- L293D Motor Driver IC
- LED Indicators
- BO (Battery Operated) motors
- 18650 Li-ion Battery
- Connecting wires
- Wheels
- Chassis

6. APPLICATIONS:

1. It will be used in cars, buses, and Trucks.
2. It will also use in any heavy-duty transport vehicle.
3. It illuminates the eye with infrared light and monitors the changes in the reflected light.
4. It is a suitable indicator for fatigue diagnostics during many, different tasks of human being activity.
5. It can detect the condition of the driver and take action on its own.

7. RESULTS:

The figure below shows the design of an automatic braking system using an IR sensor.
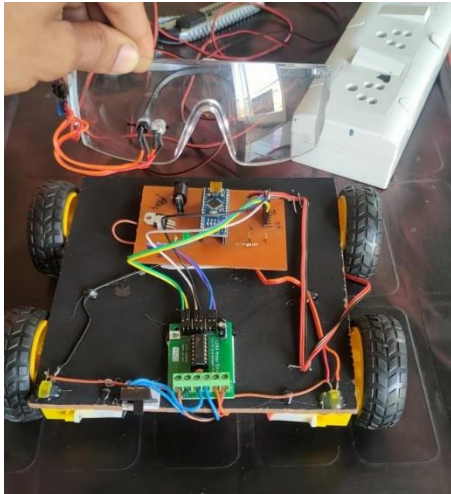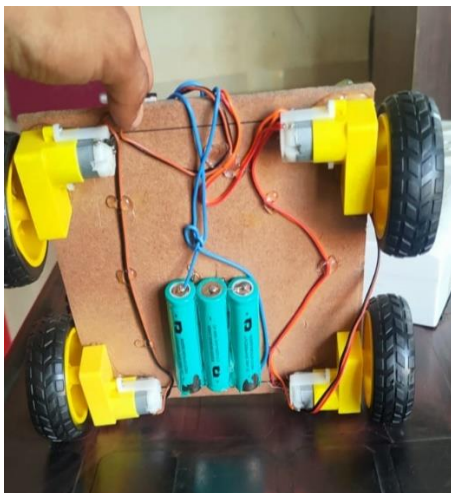

Fig No. 1

Fig No. 2

The results of automatic braking system show that the automatic braking system can stop/ break the vehicle and prevent major accidents from occurring on the highway and saves may life. This suggests that an eye blink sensor and an Arduino Nano offer one of the best tools for detecting driver drowsiness

8. FUTURE SCOPE

1. By including a GPS location of the vehicle can be detected.

2. By including the Ultrasonic sensor obstacle in the path can be detected and braking should be applied to avoid an accident.

3. Including the automatic emergency breaking we can avoid the collision.

4. Regenerative braking can be used with automatic braking

5. While braking, the vehicle can park safely.

6. System can be employed in material handling carts and driving machines in industries.

9. CONCLUSION

The driver fell asleep and did not have time to control the vehicle, causing the accident. The automatic braking system can successfully control the vehicle, avoid an accident and save many lives.

The proposed system for automatic braking has many potential applications, especially in developed countries where research on smart vehicles and smart highways has received much attention. By using this vehicle system, traffic accidents can be prevented. By integrating this system with other subsystems such as automated traction control systems, intelligent vehicle operation is possible.

10. REFERENCE

1. Milind S. Deotale, Hrishikesh Shivankar, Rohit More "Review on Intelligent Braking System", International Journal on Recent and Innovation

2. Gopal P. Gawande, Shruti V. Gavhale, Irshad

3. A. Zariye, Sagar P. Ritpurkar "Review of speed control and automatic braking system" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol. 3,Issue 2, Feb 2016.

4. Dhanya R.R.R. Jeyanthi, "Automated Braking System with Sensor Fusion Concept" IEEE 4(1) June 2012.

5. B. Praveenkumar, K. Mahendrakan "Prevention of Accident Due to Drowsy by Using Eye Blink" International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297: 2007 Certified Organization) Vol. 3, Issue 5, May 2014

6. C Grover, I Knight, F Okoro, I Simmons, G Couper, P Massie and B Smith "Automated Emergency Braking Systems: Technical requirements cost and benefits", Published Project Report 2008.