ACCIDENT PREVENTION SYSTEM AT HAIRPIN BENDS

GUIDED BY :

**Mrs.S.Nivishna ,
Assistant Professor .**

TEAM MEMBERS :

**B.INFANT BENA(927622BEC076)
P.JEEVITHA(927622BEC084)
V.KAVIKA(927622BEC093)
V.MAGUDEESHWARI(927622BEC108)**

PROBLEM STATEMENT

The problem statement for preventing accidents at a hairpin bend could be: "Design and develop a cost-effective and efficient Collision Avoidance System to reduce accidents and near-misses at hairpin bends on hilly roads, by detecting approaching vehicles and providing timely warnings to drivers, thereby improving road safety and traffic flow."

INTRODUCTION

➤ According to survey 10% of the total accidents are happen in hairpin bends.

➤ This project gives a proposed solution to address the issue of accidents that occur in hairpin bends.

➤ This system uses sensors to detect vehicles approaching the bend.

OBJECTIVES

➢ This notifies the driver about the vehicles approaching from the other side of the blind corner.

➢ The driver then can carefully take the turn and ensure a pleasant and safe journey.

➢ Accidents can be prevented and a lot of lives and loss of vehicles can be saved when implemented at hairpin curves in the real world.

EXISTING SYSTEM

CONVEX MIRROR:

➢ Nowadays this setup is widely used in all the hilly regions.
➢ These mirrors reflect the vehicles coming in the opposite side.
➢ The main disadvantage of this system is difficult to keep the mirrors clean at all time. It may reduce the reflection rate and provide poor judgment to the driver.

SIGNBOARDS:

➢ These sign boards for hairpin bends will just represent there are sharp bends coming upon the road ahead and alert to go slow.
➢ Nevertheless, this will not provide any details about the vehicles coming in the opposite side.

HORN:

➢ Vehicle horn is one of the most common methods used to alert the drivers
➢ In turnings like curves and hairpin bends. The drivers on both sides judge the
➢ distance of another vehicle based on the intensities of sound from their respective
➢ horns. This method is inefficient because horn sound may not be clear in raining
➢ time and causing a lot of confusion between drivers.

HEADLIGHTS:

➢ Flashing the headlights while driving is similar to the vehicle horn but it is used only in night times. This is also inefficient method because we cannot use headlights in the daytime.

PROPOSED SYSTEM

➢In this proposed system we uses IR Sensors , Arduino , PCB Board , LED lights.

➢IR sensor is used to detect vehicles .

➢ The sensor data is send to the Arduino board.

➢Then Arduino controls LED light.If the vehicle approaches the bend then RED light will glow else GREEN light will glow when no vehicle is detected .

➢Our project doesn't make any distractions to the drivers while driving.

COMPARISON

EXISTING SYSTEM

➢ Existing systems are Convex Mirror , Signboards , Horn .

➢ These are having some disadvantages.

➢ These are doesn't give clear information about the opposite side.

PROPOSED SYSTEM

➢ In this project we uses IR sensor to detect vehicles and the sensor data is send to the Arduino board then it controls LED light.

➢ Our project doesn't make any distractions to the drivers while driving.

BLOCK DIAGRAM
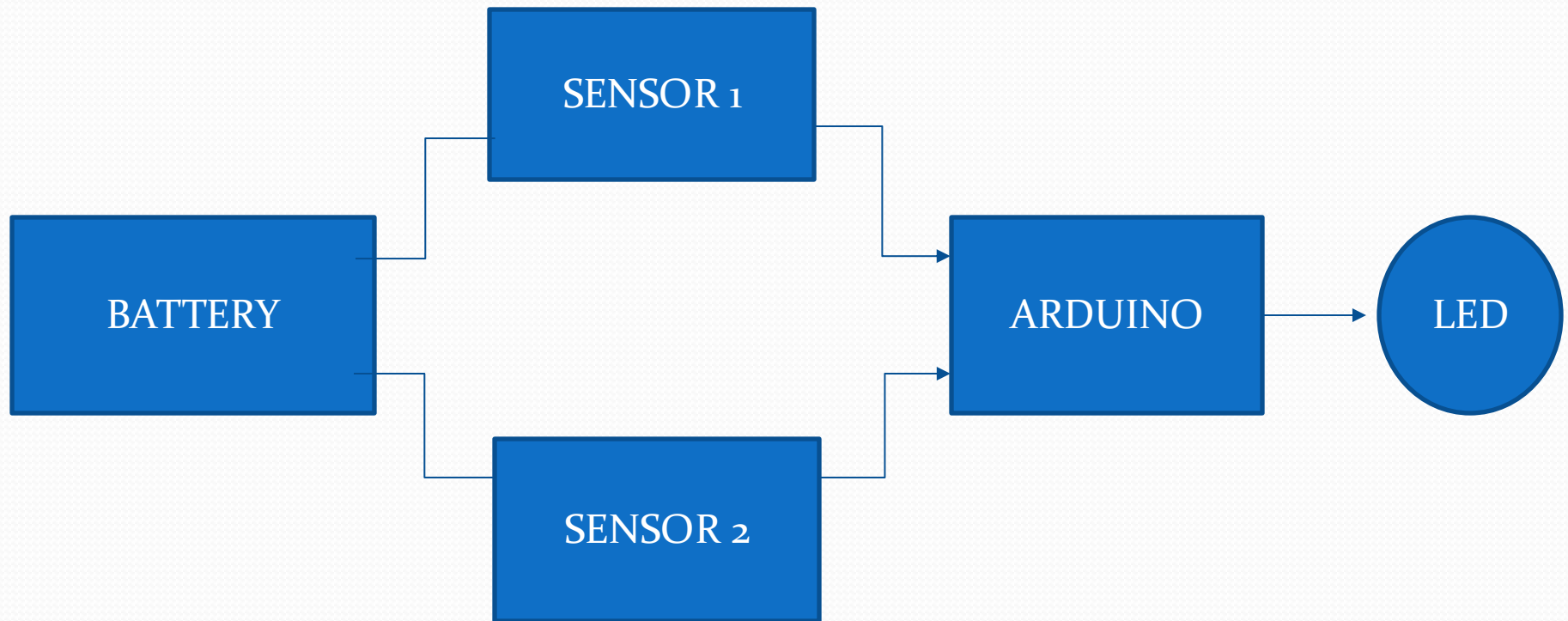
COMPONENTS

❖ IR SENSOR

❖ LED LIGHTS

❖ PHOTODIODE

❖ TRANSISTOR

❖ RESISTOR

❖ DIODE

❖ RELAY

❖ PCB BOARD

IR Sensor:
Detects vehicles and obstacles by emitting infrared light and measuring the reflection.

LED Lights:
Used for warning indicators, such as displaying "Slow Down" or "Caution" messages.

Photodiode:
Converts light into electrical current, used to detect changes in light intensity.

Transistor:
Acts as a switch or amplifier to control the flow of electrical current.

Resistor:
Limits the flow of electrical current to protect components from damage.

Diode:
Allows current to flow in one direction, protecting against reverse voltage.

Arduino PCB Board:
The brain of the system, processing inputs and controlling outputs.

WORKING

Sensing: The IR sensor or photodiode at the centre of the bend detects the vehicle.

Data transmission: The sensor sends the detection data to the Arduino board.

Arduino processing: The Arduino board processes the data and calculates the vehicle's speed and distance from the centre.

LED light activation: The Arduino board sends a signal to the LED lights, which then illuminate to warn the driver.

Warning display: The LED lights display a warning message, such as "Slow Down" or "Caution," to alert the driver.
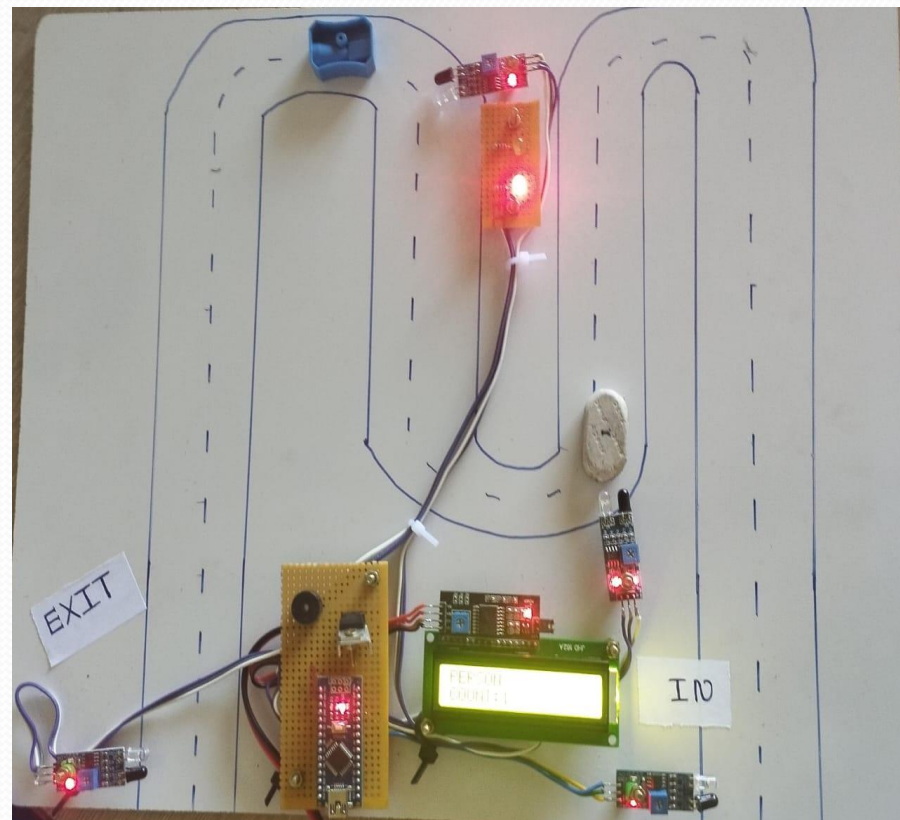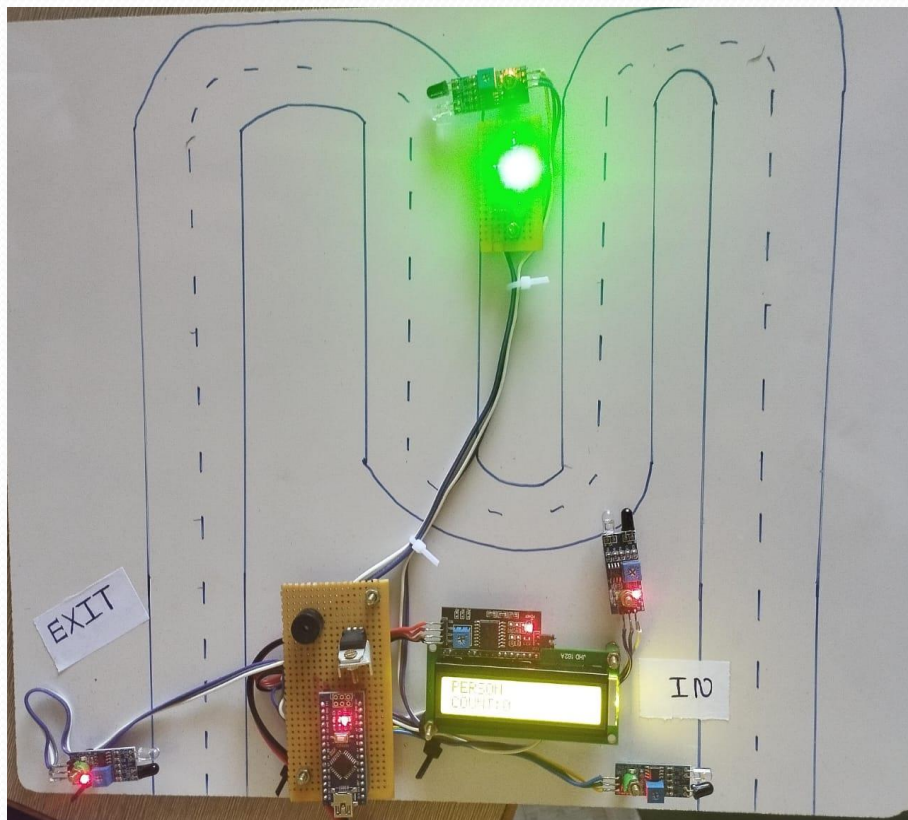
ADVANTAGES

1. **Improved Road Safety:** Reduces accidents and near-misses at hairpin bends.
2. **Enhanced Driver Awareness:** Warns drivers of potential collisions, promoting cautious driving.
3. **Real-time Warning:** Provides timely warnings to drivers, allowing for prompt action.
4. **Easy Installation:** Can be installed at existing hairpin bends with minimal infrastructure changes.
5. **Cost-Effective:** Compared to other collision avoidance systems, this project is relatively low-cost.
6. **Scalability:** Can be adapted for use at various types of intersections and road

CONCLUSION

➢ The use is preventing accidents in hairpin bends.

➢ Hairpin bends have sharp turns and bends. They are more prone to accidents endangering human life.

➢ Life is important than any other thing, once gone cannot be regained. So, to save this valuable life.

➢ This method have important role. It can help Road users at Ghats.

REFERENCES

- 1)J.MahendraReddy,2)K.Jyothi,3)A.Nageswari,4)Dr.K.Rasa dura i*"Alerting system in ghats Department of Electronics and Communication Engineering 4 Professor, Department of Electronics and Communication Engineering, 1-5Kuppam Engineering College, Kuppam 517425, India

- 1)Anand M G,2)A Dhanyakumar,3)Bhaskar N,4)MahalingS B*"Sensor Based Accident Prevention System in Curving, B.E, Mechanical Engineering, Alva's Institute of Engineering &Technology, Mangalore, Karnataka.

- [3] https://en.wikipedia.org/wiki/Arduino