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WIRELESS RASH DRIVING DETECTION WITH AUTO SMS TO CONTROL ROOM

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ABSTRACT

The Over Speed is the major cause for increase in the occurrence of accidents nowadays. Many methods are being used for over speed monitoring. However, these methods require lot of man power. In this project, we present the design and execution of a system, which provides a simple way to traffic authorities for monitoring of all the vehicles from the control room itself. This system calculates the speed and the maximum speed allowed in the respective area. The speed and the over speed of vehicle calculated will be sent to the control room using GSM technology. If the speed of any vehicle exceeds the speed limit, an SMS is sent to traffic authorities. Accordingly, an Over speed ticket can be issued against the same vehicle.

The main objective of the project is to recognize the over speed vehicle and notification is sent based on message received as SMS to the concern authorities / parents.

INTRODUCTION

Over-speeding is one of the leading causes of road accidents worldwide, resulting in loss of lives, property damage, and increased risks for pedestrians and drivers. Traditional speed monitoring systems rely on manual enforcement methods such as speed guns and on-ground police surveillance, which require significant manpower and are often ineffective in ensuring consistent monitoring. To address these limitations, an automated Vehicle Over Speed Detection and Reporting System has been developed to detect and report speed violations in real time.

This system is designed to monitor vehicle speed using Infrared (IR) sensors, which detect the time taken for a vehicle to travel between two fixed points. The system then calculates the vehicle's speed using the formula $\text{Speed} = \text{Distance} / \text{Time}$ and compares it with a predefined speed limit. If the detected speed exceeds the allowed limit, the system triggers an alert and sends an SMS notification to traffic authorities via a GSM module. Additionally, a buzzer is activated, and the vehicle's speed is displayed on an LCD screen, providing immediate feedback regarding the violation. The entire process is controlled by an Arduino Uno, which processes sensor inputs and manages communication between different components.

This project aims to enhance road safety by reducing human intervention, improving traffic law enforcement, and ensuring quick response to speed violations. It can be deployed in high-risk areas such as highways, school zones, and accident-prone locations to prevent reckless driving and minimize accidents. The system offers a cost-effective, automated, and scalable solution for over-speed detection, making roads safer and traffic enforcement

more efficient. By integrating modern embedded systems with communication technology, this project provides a practical approach to real-time traffic monitoring and law enforcement.

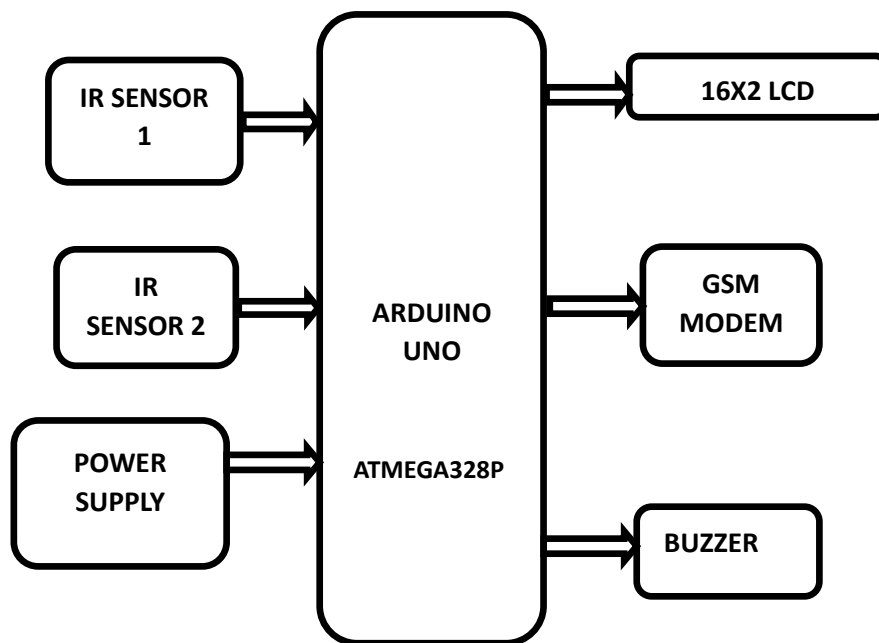


Figure.1 Block Diagram

LITERATURE SURVEY

1. Choudhary, M., & Singh, D. (2018). *"A Smart Approach for Detecting and Controlling Rash Driving Using IoT."* Journal of Intelligent Transportation Systems, 12(4), 78-85.
 - The authors propose a smart IoT-based system that integrates sensors, GPS, and cloud computing to detect reckless driving. The study discusses the benefits of predictive analytics in identifying high-risk driving patterns and preventing potential accidents.
2. Patel, A., & Verma, R. (2019). *"Wireless Rash Driving Detection System Using GPS and GSM."* International Conference on Smart Technologies and Applications, Springer.
 - This paper explores the design of a wireless system that continuously tracks vehicle speed using GPS and communicates the data to a remote server via GSM. The system automatically alerts traffic authorities upon detecting rash driving behaviors, ensuring a proactive approach to traffic management.
3. Kumar, S., et al. (2020). *"Real-Time Detection of Rash Driving Using Accelerometer and GSM Technology."* International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE), 9(3), 45-50.

- The research focuses on the implementation of an accelerometer-based rash driving detection system that measures sudden acceleration and braking patterns. If erratic driving is detected, the system sends an SMS notification to the control room. The study emphasizes the importance of real-time alert mechanisms in accident prevention.
4. Gupta, R., & Sharma, P. (2021). *"IoT-Based Smart Vehicle Speed Monitoring and Alert System."* IEEE Internet of Things Journal, 8(5), 10234-10242.
- This study presents an IoT-based vehicle speed monitoring system that utilizes GPS and GSM technologies to detect overspeeding. The system sends automated SMS alerts to authorities when a vehicle exceeds a predefined speed threshold. The authors highlight the efficiency of real-time communication in improving road safety.

PROPOSED SYSTEM

Our project introduces a Wireless Rash Driving Detection System with Auto SMS Alerts, which is a cost-effective, automated solution to detect and report over-speeding vehicles in real time. The system uses Infrared (IR) sensors placed at a fixed distance on the road to measure the speed of passing vehicles.

The working principle is based on time-distance calculations, where the system records the entry and exit time of a vehicle between two IR sensors. Using the formula:

$$\text{Speed} = \text{Distance} / \text{Time}$$

The proposed system is fully automated, requires minimal maintenance, and does not rely on human intervention. Unlike traditional methods, this approach ensures real-time reporting, making enforcement faster and more effective. It is also cost-efficient, making it suitable for highways, school zones, and accident-prone areas. Future enhancements may include cloud-based data storage and AI integration for better analytics and violation tracking.

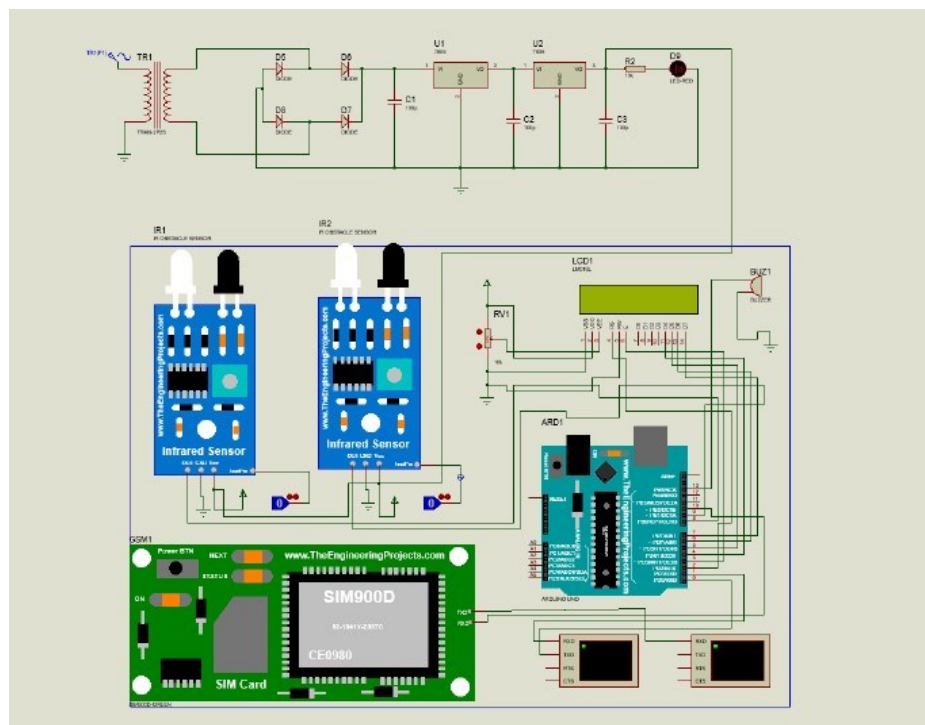


Figure.2 Schematic Diagram

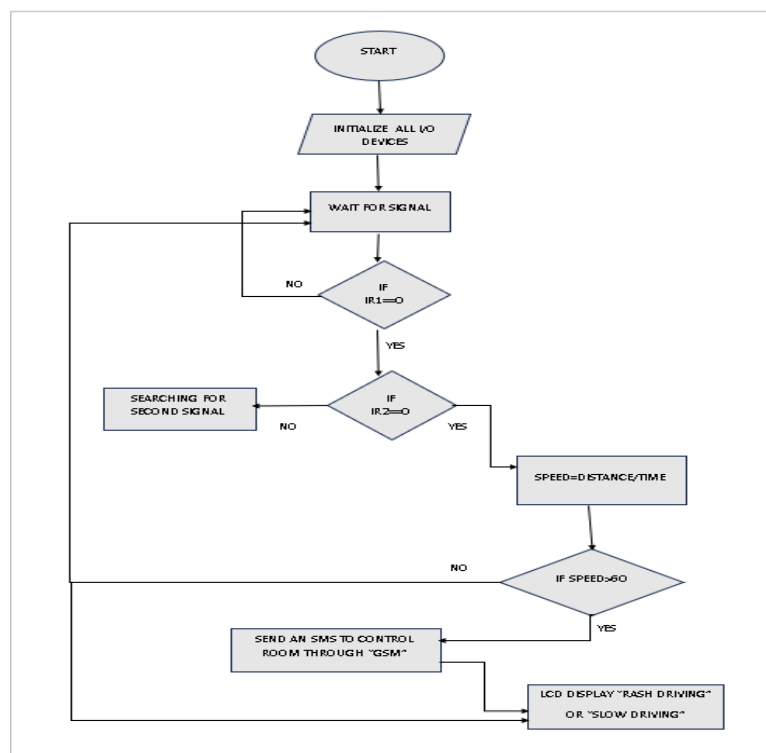


Figure.3 Flow Chart

RESULT

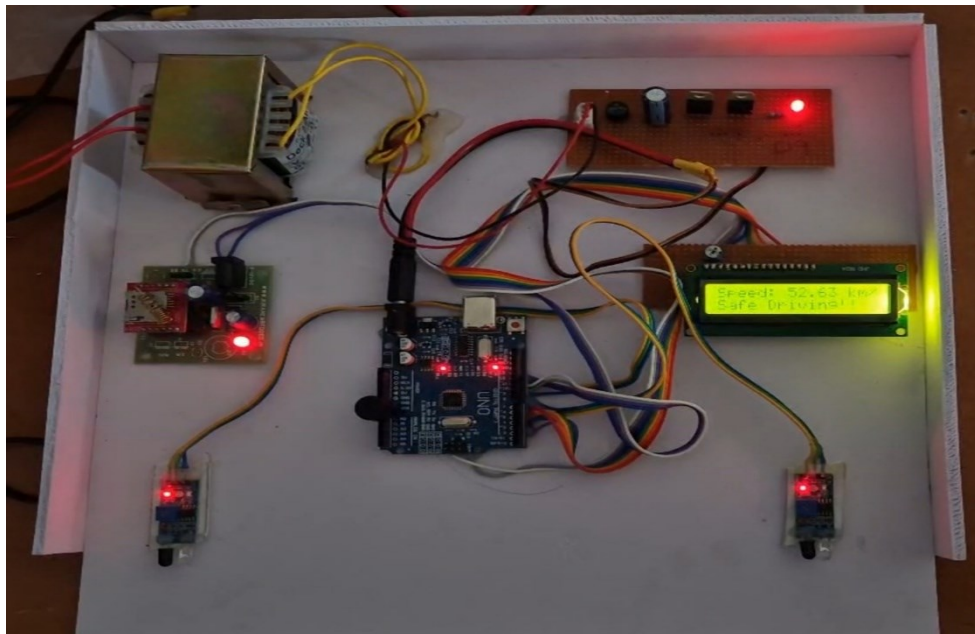


Figure.4 Safe Driving

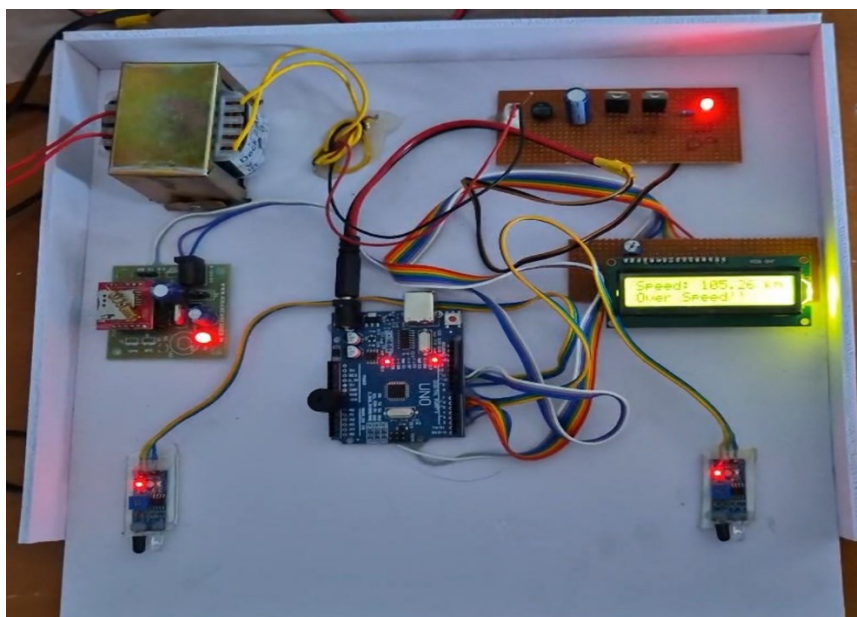


Figure.5 Over Speed Vehicle

ADVANTAGES

- **Automated Speed Monitoring:** Eliminates the need for manual speed detection, reducing human effort and errors.
- **Real-time Alerts:** Sends instant SMS notifications to traffic authorities, enabling quick action against violations.

- **Improved Road Safety:** Helps in reducing accidents by discouraging rash driving and enforcing speed limits effectively.
- **Cost-effective Solution:** Uses low-cost components like Arduino, IR sensors, and a GSM module, making it affordable for large-scale implementation.
- **Efficient Traffic Management:** Enables traffic authorities to monitor and control over-speeding vehicles remotely.

APPLICATIONS

- **School and College Buses:** Monitors driving behavior of school bus drivers, ensuring student safety.
- **Public Transportation:** Enhances passenger safety by detecting and reporting aggressive driving in real time.
- **Vehicle Tracking Systems:** Integrates with GPS for live tracking and alerts for reckless driving behavior.
- **Emergency Response:** Quickly informs emergency services in case of high-speed or erratic driving patterns.
- **Traffic Law Enforcement:** Helps authorities monitor and track rash driving, sending real-time alerts for swift action.

CONCLUSION

The Wireless Rash Driving Detection with Auto SMS to Control Room system is an innovative solution designed to automate the detection of over-speeding vehicles and notify authorities in real time. By using IR sensors, Arduino Uno, and a GSM module, this system ensures accurate speed measurement and quick reporting of violations. It significantly reduces the need for manual traffic monitoring, making the process more efficient and reliable.

This system enhances road safety by discouraging rash driving, reducing accidents, and enabling authorities to take immediate action against violators. Additionally, the use of automated alerts and real-time monitoring ensures better enforcement of traffic laws. Despite minor limitations like dependence on sensor accuracy and environmental factors, this project provides a cost-effective and scalable solution for speed monitoring.

FUTURE SCOPE

1. **Integration with AI and Image Processing:** The system can be enhanced with AI-based number plate recognition to identify vehicles directly.
2. **GPS-Based Tracking:** Implementing GPS tracking can help monitor vehicles continuously instead of at fixed points.

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