Result Paper on IoT Based Wireless Electric Vehicle Charging System

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ABSTRACT

Road safety and maintenance are critical concerns for transportation infrastructure. Potholes and humps on roads pose significant risks to drivers, passengers, and vehicles. Traditional methods of detecting road anomalies rely heavily on manual inspection, which is time-consuming, costly, and often inefficient. In response, this paper proposes an Automatic Humps and Pothole Detection System (AHPDS) utilizing Internet of Things (IoT) technology. Automatic Humps and Pothole Detection System represents a significant advancement in road safety and maintenance practices. By leveraging IoT technology and data analytics, the system offers a scalable and efficient solution to address the challenges associated with road anomalies, ultimately contributing to safer and more sustainable transportation networks.

Keywords: Road Safety, Smart City, Pothole detection, Humps detection, Obstacle Detection.

I. INTRODUCTION

The quality of road infrastructure is a fundamental aspect of modern transportation systems, influencing safety, efficiency, and overall user experience. However, road networks are subject to wear and tear, leading to the formation of potholes and humps that pose hazards to drivers, pedestrians, and vehicles. Traditional methods of monitoring road conditions rely heavily on manual inspection, which is labor-intensive, time-consuming, and often reactive rather than proactive.

Using Ultrasonic sensor system detects the Obstacle which are present in front of vehicle. Using IR sensor system detects the Potholes before reaching the actual pothole it detects it and stops the vehicle and also it will start the buzzer so that Driver will get alert.

And after that Using IR sensor drowsiness is also detected. As soon as driver closes its eyes for some while then vehicle will automatically be stopped and buzzer start ringing so that driver will get alert and it will increase the safety of driver.

Chargeable batteries are used to charge the battery. Battery is of 12 volts.

II. LITERATURE SURVEY

Asperpaper[1]"Automatic Detection of Potholes and Humps on Roads " Prof. Chandrakant Bhange, Sneh Kurhade, Laukik Arewer, Ashish Kumar presents a detection and notification of Humps and Pothols on roads to aid drivers.

As per paper [2] "Automatic Detection and Notification of Potholes and Humps on Roads using IoT" authored by Swetha, Punithgowda, Lalithesh, Deepak Sharan, Shivuprasad captures the geographical coordinates of the potholes and humps using a GPS receiver and sends the data to maintenance authorities for analysis and action.

In paper [3], "detection pothole and humps on the road and information sharing" by Prof. Lavanya, Vijayalakshmi, Manu, Kushbu, Varsha examines the detection of potholes on roads. This system, that we call the Pothole Detection System, uses Accelerometer Sensor of Android smartphone for detection of potholes and GPS for plotting the location of potholes on Google Maps.

In paper [4]," Development of an Effective Road Surface Monitoring System for Automated Pothole Detection" The problem solved in this paper is the development of an effective road surface monitoring system for automated pothole detection. This system aims to provide real-time information to drivers about potholes on the road, helping them avoid accidents and enabling authorities to take preventive actions.

As per paper [5], "A CostEffective Solution for Pothole and Hump Detection on Roads in India" by Lokesh S and SrinivasG The paper aims to propose a cost effective solution for the automatic detection of potholes and humps on roads and collecting data to fix the problem.

According to paper [6], "Automatic Detection of Potholes and Humps on Road." authored by ParagKadale, Shivam Barde, AnandPawa, the project focuses on potholes on roads and the development of a system to provide timely action to avoid accidents or vehicle damages. Ultrasonic sensors are used to identify the potholes, and the depth of the pothole is displayed on an LCD screen.

As per paper [7], "Automatic Detection of Potholes and Humps on Roads to Driver Using PIR Sensor." Authors Mr.S. Rajadurai, Mr.P. Thiyagarajan, Ms.R. Sandhiya presents thetopicThe problem addressed in this paper is the high number of road accidents and casualties in India, caused by factors such as bad roads, careless user behaviour, and poor enforcement of traffic rules. The paper proposes a solution that involves using sensors in vehicles to detect road anomalies like potholes, and transmitting this data to a central system for analysis

According to paper [8], "Automatic humps and pothole detection on road" authored by Mahesh Jala, Ajay Chauhan, Prof. Varun Mishra, The problem solved in this paper is the detection of potholes on roads and the development of a system to provide timely action to avoid accidents or vehicle damages. Ultrasonic sensors are used to identify the potholes, and the depth of the pothole is displayed on an LCD screen.

In paper [9], "Automatic Detection and Notification of pothole and Humps on Roads Using IOT," authors Kunal D. Patil, Shardul R. Patil, Vipul V. Kale, and Shubham S. Thorat explore The problem statement of the paper is to address the issues of potholes and humps on roads in India, which contribute to traffic congestion, accidents, and loss of human lives.

III.PROPOSED SYSTEM

Here in this section, we will cover points regarding our proposed system. Our proposed system is explained here with problem statement, Block diagram, Software and Hardware requirements.

A.   Problem Statement

To design and develop such System which detects the Humps and pothole before reaching to that particular hump or pothole so that it will increase road safety with the help of IoT. To design a system which also detects the drowsiness of the driver so that it will avoid the accidents on the road by start ringing the buzzer when driver sleeps

B.   Block Diagram:

The block diagram includes a 12-volt battery regulated by an IC 7805, powering an Arduino microcontroller managing system functions and interacting with aIR sensor for high-voltage control. Ultrasonic sensor uses the 5v supply and detects the Obstacles. And IR sensors to detects the Pothole and Drowsiness. LD293D driver to control the Motors or we can say controls the vehicles wheel.
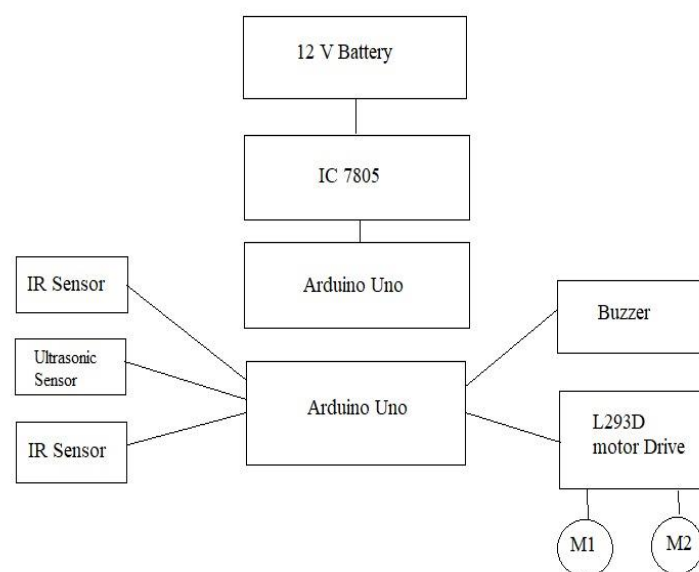

Figure 1: Proposed Architecture

C.   Software Requirement

• Operating System -Windows11
• Programming Language-C
• IDE–Arduino

D.   Hardware Requirement

• Battery 12Volt
• IR Sensor
• Integrated Circuit 7805
• Ultrasonic Sencer
• Arduino
• LD293D driver
• DC motors

IV. RESULT DISCUSSION

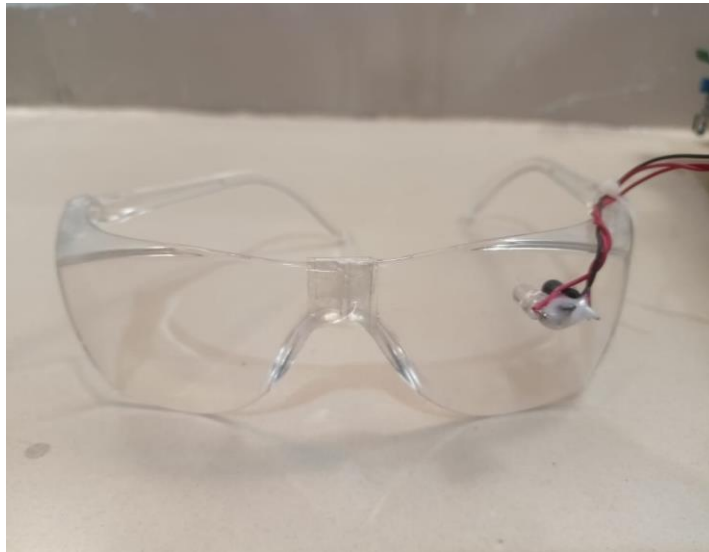Here this section covers the result of implemented project.

Figure 2: Drowsiness Detection

The Drowsiness of Driver is detected using IR sensor. IR sensor is connected to the Goggle. It is mandatory to wear the goggle when driver drives. When drivers close its eyes for some while then vehicle will automatically be stopped and Buzzer starts ringing.
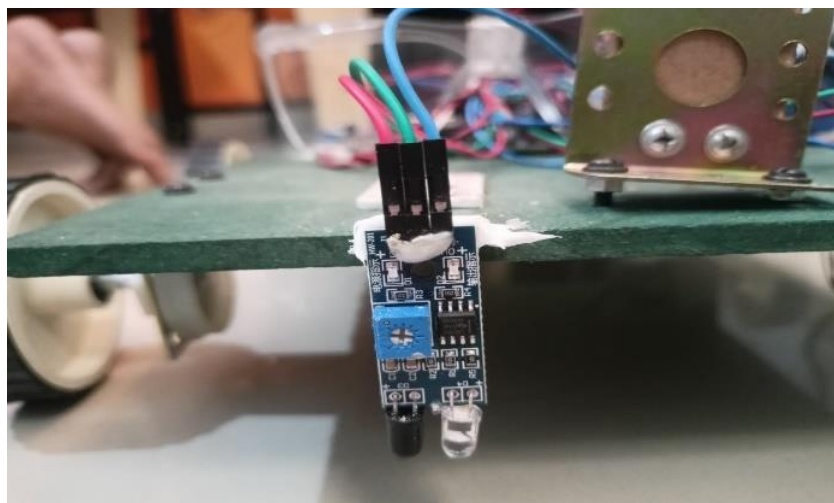

Figure 3: Drowsiness Detection

When any pothole occurs in front of vehicle then vehicle will automatically stopped. Using IR sensor the pothole will be detected.
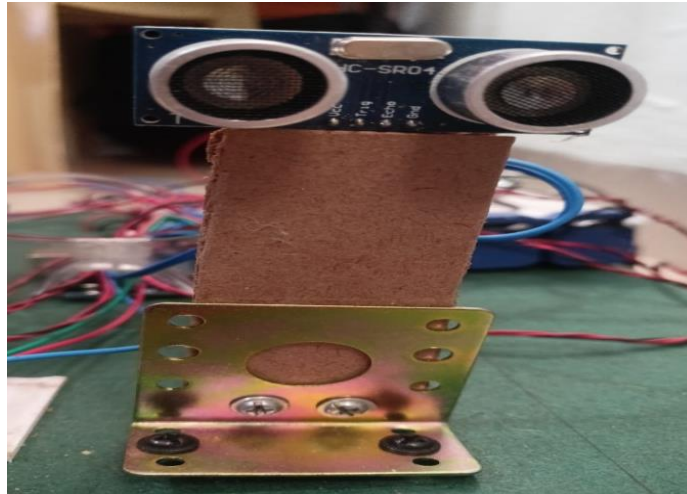
Figure 4:　Humps or Obstacle detection

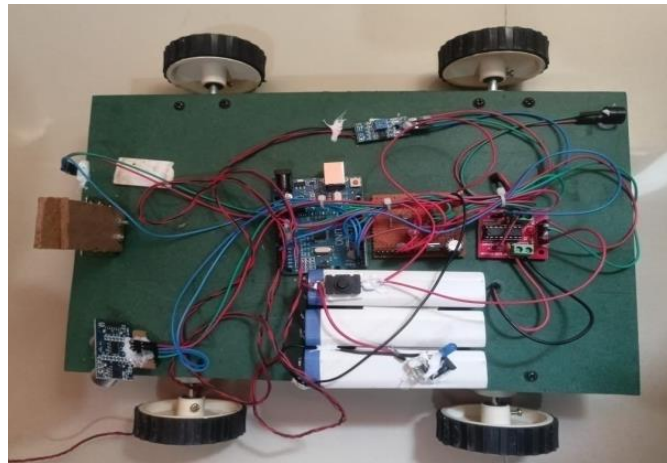Using Ultrasonic sensor Humps and Obstacles in front of vehicle will be Detected.

Figure 5:　Hardware kit

This is the hardware kit of our Automatic Humps and Pothole Detection system comprises essential components such as Arduino, Altrasonic Sensor, IR sensor, IC7805, LD293D driver, 12V Battery, DC Motors, etc.
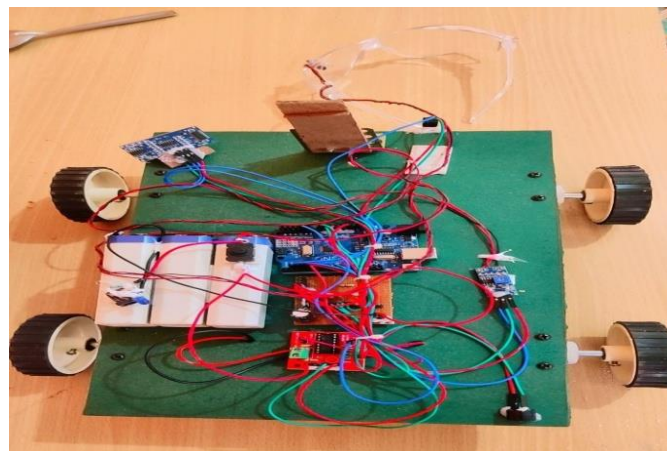

Figure 6:　Automatic Humps and Pothole Detection System

This System will increase the road safety and provide security while driving. Also, it is usefull application for smart city.

V. CONCLUSION

In conclusion, the development and implementation of automatic humps and pothole detection systems represent a significant stride towards safer and more efficient road transportation. These systems leverage advanced technologies, including IoT, computer vision, and machine learning, to address critical road infrastructure challenges. An automatic humps and pothole detection system can significantly enhance road safety and infrastructure maintenance. By utilizing advanced sensors and technology, it enables real-time identification of road irregularities, allowing for timely repairs and improved driving conditions. Implementation of such systems can contribute to smoother traffic flow and reduce accidents, ultimately enhancing the overall efficiency of road networks.

VI. REFERENCES

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