JTechS

JOURNAL OF TECHNICAL SCIENCES

Vol. 1 (1/2024)

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JOURNAL OF TECHNICAL SCIENCES

Vol.1 (1/2024)

Publisher: Mother Teresa University in Skopje, Republic of North Macedonia

Creating a parking sensor by utilizing arduino

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ABSTRACT
Creating a parking sensor by harnessing the capabilities of an Arduino Uno board, an ultrasonic sensor, and a buzzer is a hands-on and accessible project designed to enhance safety and convenience during vehicle parking maneuvers. This innovative do-it-yourself (DIY) system incorporates an ultrasonic sensor to precisely measure distances between the vehicle and potential obstacles within its vicinity. The Arduino Uno board processes this distance data in real-time, facilitating intelligent decision-making. This project serves as an excellent example of how affordable components, open-source Arduino technology, and a little programming knowledge can be combined to create practical solutions for everyday challenges.

KEYWORDS
Parking sensor; Arduino Uno; Ultrasonic sensor; Innovative; Vehicle safety.

1 Introduction

Creating a parking sensor using Arduino involves designing a system that can detect the proximity of obstacles and alert the user to avoid collisions while parking. Arduino, a popular open-source electronics platform, serves as the brain of the project, allowing you to interface various sensors and components. Typically, ultrasonic sensors are employed to measure distances accurately. The Arduino processes the sensor data and triggers alerts through visual or audible signals, indicating the proximity of obstacles. This DIY project offers an affordable and customizable solution for enhancing parking safety by leveraging the flexibility and programmability of Arduino. It's a great example of how technology can be applied to address real-world challenges in a practical and innovative way.

1.1 Research

1.1.1 Purpose of the parking sensor project

The primary objective of the parking sensor project is to enhance parking safety through the utilization of Arduino-based technology. This section provides an overview of the project's goals and explains how the integration of Arduino enables the creation of an efficient and customizable parking sensor system. By detecting the proximity of obstacles during parking maneuvers, the project aims to mitigate the risk of collisions and improve overall vehicle safety. Additionally, this section outlines the broader context of the project, emphasizing its relevance in addressing real-world challenges related to parking in various environments.

1.1.2 Components and Sensor Integration.

In this section, we delve into the specific components and sensors integrated into the Arduino-based parking sensor system. The core element of the project involves the use of ultrasonic sensors for accurate distance measurement. We explore how these sensors interface with the Arduino microcontroller, detailing the wiring and connections necessary for seamless communication. Furthermore, this section provides insights into additional components, such as LEDs or buzzers, which serve as visual or audible indicators to alert the user of approaching obstacles. By understanding the integration of these components, contributors gain valuable insights into the technical aspects of the project and how the Arduino platform facilitates the interaction between sensors and user feedback mechanisms.

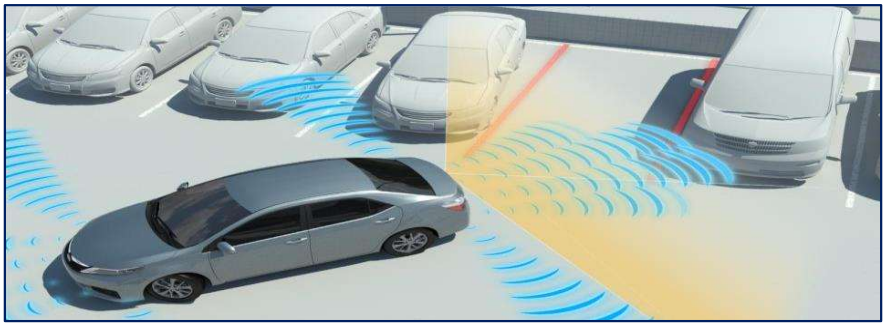

Figure 1: Parking made easy with visual waves – the smart sensor guides the way.

2 Structure:

2.1 More in-depth information about the project

2.1.1 Working principle

The primary objective of the parking sensor project is to enhance parking safety through the utilization of Arduino-based technology. This section provides an overview of the project's goals and explains how the integration of Arduino enables the creation of an efficient and customizable parking sensor system. By detecting the proximity of obstacles during parking maneuvers, the project aims to mitigate the risk of collisions and improve overall vehicle safety. Additionally, this section outlines the broader context of the project, emphasizing its relevance in addressing real-world challenges related to parking in various environments.

2.1.2 Scalability

To scale up a parking sensor system utilizing Arduino for larger applications, the design can be enhanced by deploying a multi-sensor array strategically distributed to cover a broader parking area. Wireless connectivity between sensors and a centralized control unit facilitates scalability and reduces wiring complexities. The centralized unit can manage data from multiple sensors, enabling a more comprehensive view of the parking space. Implementing features such as data logging, smart city infrastructure integration, machine learning for advanced analytics, and mobile app interfaces can further optimize parking space utilization and enhance user experience. Power management solutions and scalable hardware resources should be considered for efficiency and adaptability, while maintaining compliance with regulatory standards ensures a robust and responsible deployment of the system. A modular design approach allows for future expansions or modifications, ensuring the adaptability of the parking sensor system to changing requirements and environments.

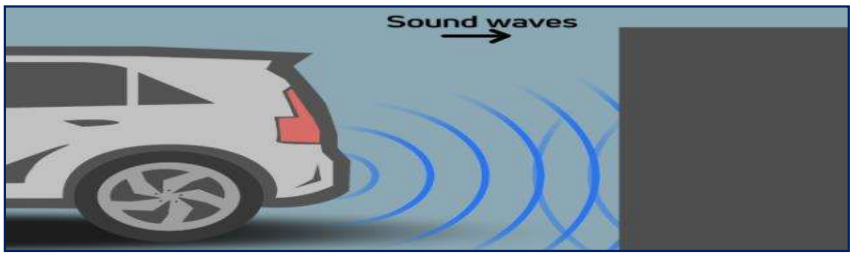

Figure 2: "Enhancing safety during reverse parking: Ultrasonic sensors.

3 Conclusion:

3.1 Concluding the research paper

1.1.1 Conclusion

The project is a useful and practical project. The working principle of the project includes using an ultrasonic sensor to measure the distance between the sensor and an object and a buzzer to give an audible warning if the distance is too far close.

The project components include an Arduino board, an ultrasonic sensor, a speaker, and power supply. The Arduino board is programmed to read the distance data from the ultrasonic sensor and control the speaker.

Overall, the project is a great introduction to the world of Arduino and electronic projects.

It provides a fun and challenging way to learn programming and electronics, while creating a useful device that can help prevent accidents at parking.

ACKNOWLEDGMENTS

I would like to express my gratitude to everyone who contributed to this project. Your support and assistance are sincerely appreciated.

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