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Smart Garage Parking Assistant with Distance Monitoring

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ABSTRACT: This project presents the development of a smart garage parking assistance using Arduino. The project aimis to provide real-time distance monitoring and guidance to drivers while parking their vehicles. It utilizes ultrasonic distance sensors to measure the distance between the vehicle and obstacles in the garage. The Arduino processes this dataand controls motorized mechanisms to guide the vehicle into the parking space, ensuring optimal positioning and preventing collisions. The project also includes a user interface such as an LCD display, to provide visual feedback to thedriver.

KEYWORDS: - Smart Garage Parking Assistant with Distance Monitoring system, Ultrasonic Sensor, LCD Display, Arduino.

I.INTRODUCTION

In these modern days finding car parking is a big issue in congested cities. There are too many vehicles on the road but notenough parking spaces. One of the biggest problems is when we enter a parking area, then we realize that there are no empty parking slots to park our cars. The proposed Smart Garage Parking Assistant includes ultrasonic sensors, an Arduino uno, buzzer and LCD display to provide real-time feedback to ensure precise and hassle-free parking. This project helps the car's driver to park their car with accurate information of the availability of the space to park.

II. RELATED WORKS

In recent years, there has been a growing body of research and development in the field of smart garage parking assistancesystems with a focus on distance monitoring and obstacle detection. Several studies have explored the use of ultrasonic sensors for precise distance measurement, while others have delved into computer vision and image processing techniques, employing cameras for object recognition and distance calculation. Additionally, LiDAR technology has gained attention for its high-precision distance measurement capabilities. Wireless communication protocols, such as Wi-Fi and Bluetooth, have been widely adopted to transmit real-time data to users' smartphones or vehicles, enhancing the user experience.

III. EXISTING METHOD

Manual Parking is the existing technology : Drivers rely on their own judgment and skills to park their vehicles. Drivers visually estimate distances and navigate obstacles. No automated guidance or real-time distance monitoring.

1. **Human Error**: Relies on driver skill, increasing the risk of collisions and damage due to misjudgments.
2. **Limited Visibility:** Drivers may struggle with blind spots and poor lighting, leading to difficulties in tight spaces.
3. **Stressful:** Manual parking in confined spaces can be stressful, especially for inexperienced or nervous drivers.
4. **Inefficient Space Use:** Lack of guidance may result in suboptimal space utilization.

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IV. PROPOSED SYSTEM

- Sensors are used to detect obstacles and calculate distances.
- Arduino processes data, offers real-time feedback.
- Visual clues and sound alerts guide drivers.
- Customizable settings for sensitivity and modes.
- It is used in the Accurate parking, collision prevention.
- It also used in Enhanced safety and stress reduction and Optimized space usage, accessibility.
- Remote control via smart home systems.
- Cost savings, user confidence, eco-friendly.

V. BLOCK DIAGRAM

The Ultrasonic sensor, sense the environment, the incoming car and the obstacle present in the parling area. This data fromthe ultrasonic sensor will be sent as output to the Arduino UNO microcontroller. Now the Arduino will process the data send by the ultra-sonic sensor and then sends the output to the buzzer lcd display and the servo motor. The output from the Arduino is serve as the input for the LCD display, the Buzzer and the Servo motor.The lcd screen will display the distancebetween the vehicle and the obstacle. The buzzer will be turned on when there the obstacle in close vicinity of the car. Theservo motor here is used to allow the car inside the parking area.

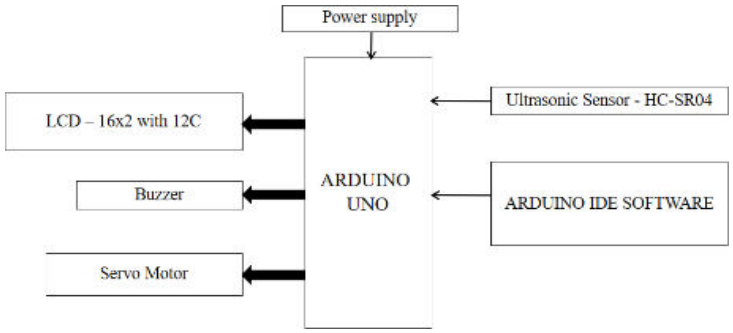
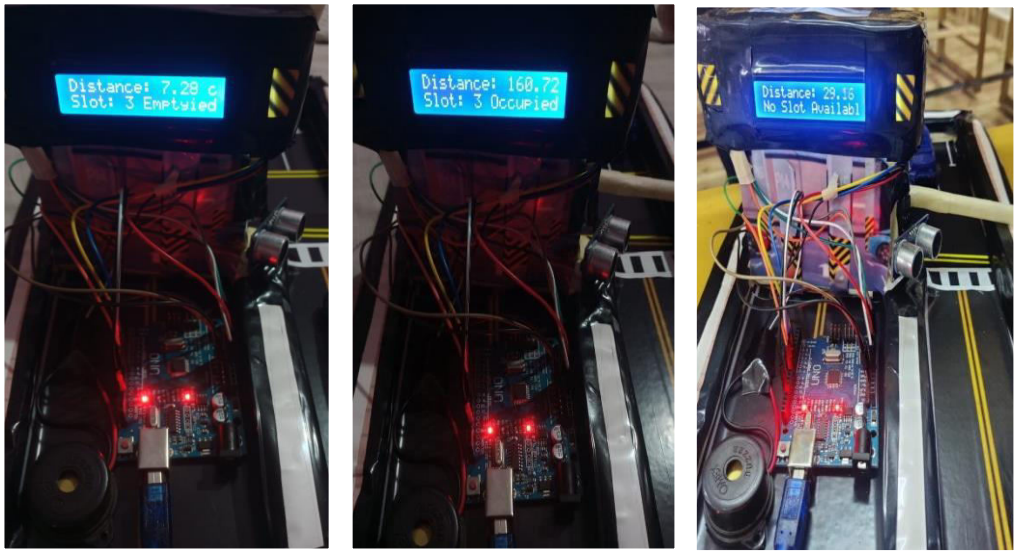


Fig 1. Block diagram for proposed method

VI. EXPERIMENTAL RESULTS

The main output is the real-time distance measurement displayed on the LCD screen. Drivers can see how far their vehicle is from obstacles. The LCD provides visual guidance, helping drivers to make informed decisions while parking. The buzzer emits audible alerts when the vehicle approaches obstacles too closely, providing an additional layer of warning. Overall, the output of the project includes real-time distance information, visual and auditory guidance, with better parkingexperience.



VII. CONCLUSION

The development of a smart garage parking assistance system with distance monitoring represents a significant advancement in the field of automotive technology and automation. This project, when successfully implemented, offers several benefits, including enhanced safety reducing the risk of accidents and collisions during the parking process., convenience, and efficiency for both residential and commercial parking applications. By minimizing unnecessary driving in search of parking spaces, the system can have a positive environmental impact by reducing emissions and fuel consumption The combination of various technologies, including sensors, cameras, connectivity solutions, and advancedalgorithms, allows for precise distance monitoring and obstacle detection.

VIII. FUTURE SCOPE

As technology continues to advance, there are several exciting directions for the future development and enhancement of smart garage parking assistance systems with distance monitoring: Integrating autonomous driving features, such as self- parking capabilities, could be the next step. This would enable the vehicle to park itself with minimal user input. The incorporation of more advanced and accurate sensors, such as LiDAR and radar, can further improve distance monitoring and obstacle detection. Research into energy-efficient technologies for these systems, including low-power sensors and eco-friendly materials, can contribute to sustainability.

REFERENCES

[1] C. Rhodes, W. Blewitt, C. Sharp, G. Ushaw, and G. Morgan, "Smart routing: a novel application of collaborative path- finding to smart parking systems," in 2014 IEEE 16th Confer- ence on Business Informatics, pp. 119-126, Geneva, Switzer- land, 2014.

[2] N. Mejri, M. Ayari, R. Langar, F. Kamoun, G. Pujolle, and L. Saidane, "Cooperation versus competition towards an efficient parking assignment solution," in 2014 IEEE International Conference on Communications (ICC), pp. 2915-2920, Sydney, NSW, Australia, 2014.

[3] European Parking Association, "Data collection-the scope of parking in Europe," 2013, http://www.europeanparking.eu.

[4] M. Du, J. Fang, and H. Cao, "A new solution for city parking guiding based on Internet of Things and multi-level multi-agent," in 2011 International Conference on Electronics, Communications and Control (ICECC), pp. 4093-4096, Ningbo,China, 2011.

[5] Journal, vol. 3, no. 1, pp. 70-95, 2016. M. A. Razzaque, M. Milojevic-Jevric, A. Palade, and S. Clarke, "Middleware for Internet of Things: a survey," IEEE Internet of Things

[6] D. Ashok, A. Tiwari and V. Jirge, "Smart Parking System using IoT Technology," 2020 International Conference on Emerging Trends in Information Technology and Engineering *(ic*-ETITE*)*, Vellore, India, 2020, pp. 1-7, doi: 10.1109/ic-ETITE47903.2020.457.

[7] A. Mackey, P. Spachos, and N. Konstantinos, "Smart parking system based on Bluetooth low energy beacons with particle filtering," IEEE Systems Journal, vol. 14, pp. 3371-3382, 2020.

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