



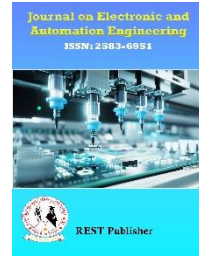
Journal on Electronic and Automation Engineering

Vol: 2(2), June 2023

REST Publisher; ISSN: 2583-6951 (Online)

Website: <https://restpublisher.com/journals/jae/>

DOI: <https://doi.org/10.46632/jae/2/2/6>



Design Of Smart Car Parking System

M. Pravalika, D. Srija, J. Abhigna, N. Manisha, K. Venugopal Rao

Jyothishmathi Institute of Technology and Science, Karimnagar, Telangana, India.

*Corresponding Author Email: abhigna.javvaji2244@gmail.com

Abstract. Our primary goal is to develop a fully automated car parking system that requires minimal human intervention. With the increasing global population, time efficiency has become crucial, necessitating the reduction of time spent on trivial activities like searching for parking spaces in busy areas and alleviating traffic congestion. Existing systems have demonstrated that accidents can occur in parking situations due to cars speeding or frustrated drivers unable to find parking for an extended period. In our project, we propose a smart and automated car parking model that allows users to pre-book their parking spaces. Once in the designated parking zone, the vehicle will be able to park automatically. What sets our automated car parking system apart is our emphasis on minimizing human involvement. Both the vehicle and the parking area will be equipped with sensors, enabling a safe and efficient parking process. Our aim is to provide a completely secure and automated experience that is reliable and can be implemented in real-time, with the hope of establishing it as the standard for parking systems in the future.

Keywords: automated car parking system, NaOH.

1. INTRODUCTION

Car parking poses a significant challenge in today's congested urban areas. The excessive number of vehicles on the road surpasses the available parking spaces, necessitating the implementation of effective parking management systems. In this regard, we present a demonstration of an Internet of Things (IoT)-based parking management system that optimizes parking space utilization through the utilization of IoT technology. To illustrate this concept, we employ IR sensors to detect the occupancy status of parking slots, coupled with DC motors to simulate gate opener motors. A Wi-Fi modem facilitates internet connectivity, while an AVR microcontroller operates the system. For online connectivity and IoT management GUI design, we utilize IOTGecko. The system utilizes IR sensors to identify occupied parking slots. Additionally, it employs IR technology to detect when a vehicle approaches the gate, automatically triggering the gate-opening mechanism. The system also reads the number of available parking slots and updates this data on the cloud server, enabling users to conveniently check parking slot availability online from any location. This seamless approach allows users to effortlessly find available parking spaces and experience hassle-free parking. As a result, the system effectively resolves the parking challenges faced by cities, providing users with an efficient IoT-based parking management system.

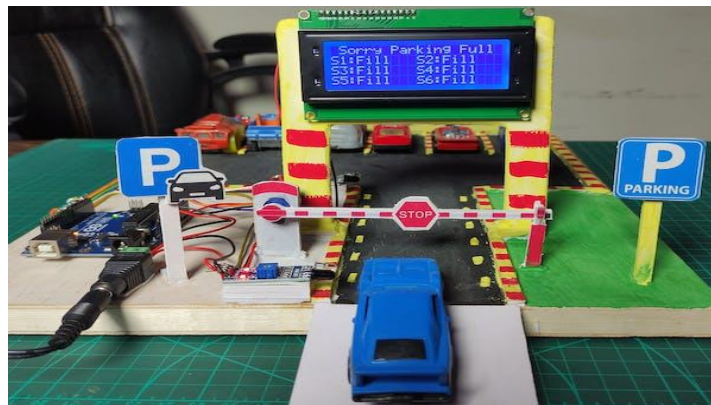


FIGURE 1. smart car parking system

This system has the capability to automatically identify available parking slots. If a slot is empty in the automated car parking, new vehicles are permitted to enter the parking lot. However, if no empty slot is found by the system, the entrance is blocked using a servo barrier. The status of free parking spaces can be viewed by visitors on a 16×2 LCD display located outside the parking area. In modern times, finding car parking spaces has become a major challenge in congested cities due to the increasing number of vehicles on the road and limited parking availability. One of the primary challenges is encountering a situation where we enter a parking area only to find that there are no available spaces to park our vehicles, resulting in the wastage of valuable time. Another issue arises when we enter a large parking area and struggle to locate an empty parking slot, leading to confusion. Many of us have likely encountered these problems, which can be frustrating and time-consuming. To address these issues, it is essential to implement efficient parking management systems in all parking areas, ensuring a hassle-free and convenient parking experience.

2. LITERATURE SURVEY

Mr. Basavaraju S has suggested an innovative approach called the Carmatic Smart Parking System, which utilizes the Internet of Things (IoT) technology. The IoT plays a crucial role in connecting various objects in the environment to a network, enabling remote access to previously unconnected devices. It is essential for individuals to stay updated with advancing technology. A common problem faced by people in urban areas like Deepthi is the difficulty in finding suitable parking spaces for their vehicles. Deepthi S and Anil A R have conducted a survey on Smart Parking Systems based on IoT. In today's world, people rely less on public transportation and prefer using their personal vehicles, leading to increased traffic. Finding a parking spot becomes a significant challenge when navigating through cities. D. J. Bonde has proposed the "Carmated Car Parking System commanded by an Android application." The objective of this project is to automate both the process of parking a car and the management of car parking spaces. The project entails developing a scaled-down version of a carmated car parking system that can effectively control and oversee the number of vehicles that can be accommodated in a specific area, depending on the availability of parking slots. Carmated parking is a method that employs sensing devices to park and organize existing cars. Abhirup Khann has focused on an IoT-based smart parking system. The concept of smart cities has gained popularity, and IoT has played a significant role in making this concept feasible. Efforts in the realm of Internet of Things (IoT) are currently focused on improving the efficiency and dependability of urban infrastructure. IoT technology tackles various challenges including traffic congestion, insufficient parking options, and road safety. In 2012, R. Yusnita, Fariza Norbaya, and Norazwinawati Basharuddin introduced the concept of an Intelligent Parking Space, aiming to address these issues. Detection System based on Image Processing”.

3. BLOCK DIAGRAM

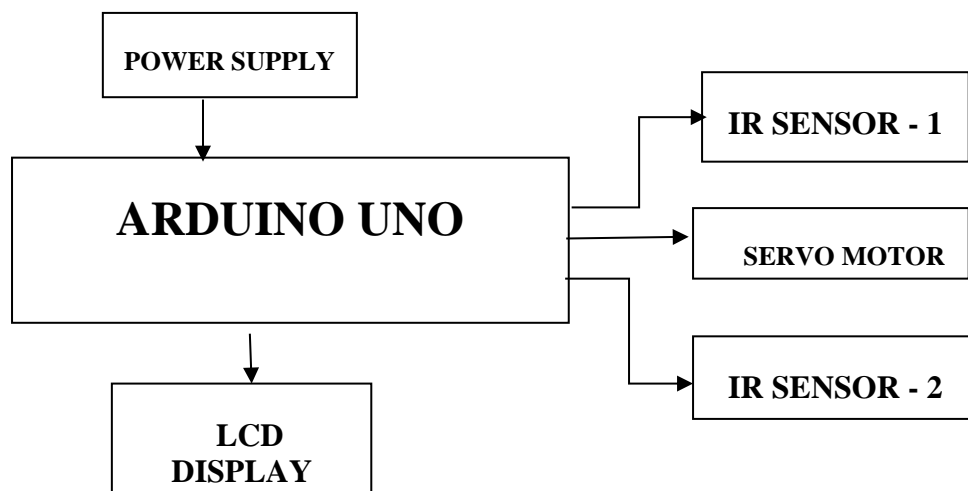


FIGURE 2. Block Diagram of Smart Car Parking System

The process of locating a parking space can be divided into three stages. Initially, the parking area is equipped with Arduino devices that incorporate sensors to facilitate communication between the user and the parking facility. Through mobile applications, users receive notifications regarding parking availability. Within each designated parking section, Arduino sensors are strategically placed to detect the number of parking slots and

identify the number of available spaces. In order to detect vehicle movement, IR sensors are utilized, and a 16x2 LCD is employed to display the parking status.

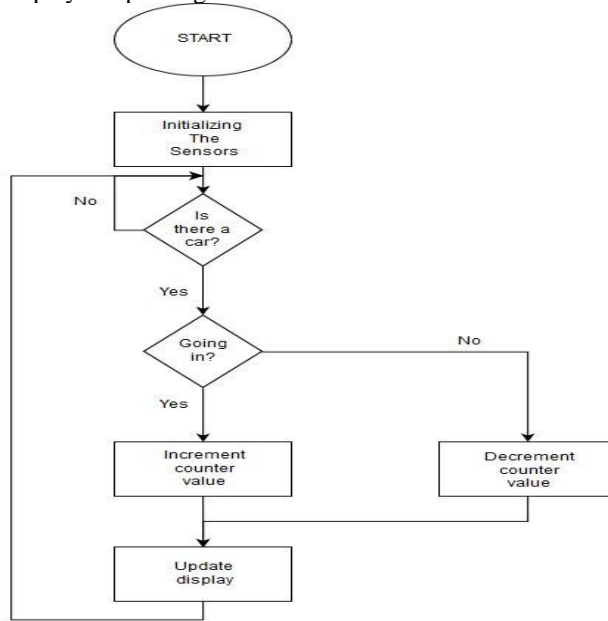


FIGURE 3. Flow Chart

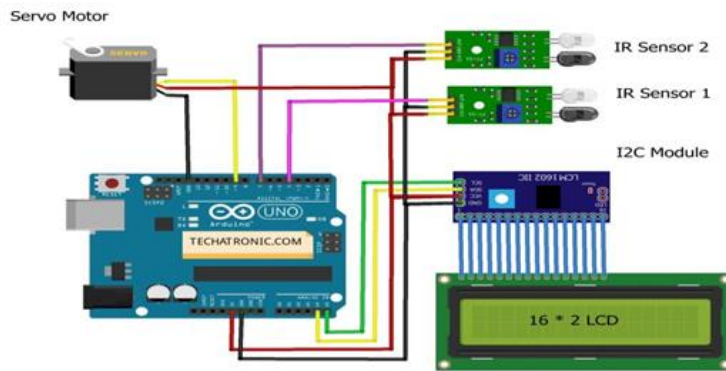


FIGURE 4. Circuit Diagram

Result: When a vehicle approaches the entrance of a parking area, a display continuously provides real-time information about the number of available parking slots. If there are vacant slots, the system activates a servo motor to open the entry gate. When a vehicle enters the parking area and takes up a spot, the display shows that the specific slot is now taken or unavailable. If all parking slots are occupied, in that case, the system displays a message stating that all slots are full and keeps the gate closed, preventing further entry.



FIGURE 5. Prototype Model

4. CONCLUSION

The public distribution system is an automated system designed to replace the current fair price shops. Its purpose is to eradicate fake ration card holders and safeguard the welfare of the general population, thereby ensuring the nation's food security. Implementing this system is expected to reduce corruption and enhance efficiency. By allowing users to choose the desired commodities and quantities, the system becomes more intelligent and resilient. This advancement is poised to propel the country's economy to new heights. Moreover, the automated PDS is relatively simple to implement and demands less effort compared to the alternative system.

REFERENCES

- [1]. L. Wenghong, X. Fanghua and L. Fasheng, "Design of inner intelligent car parking system", *International Conference on Information Management Innovation Management and Industrial Engineering*, 2008.
- [2]. B. Turner, "Organization of the petroleum exporting countries (opec)", *The Statesmans Yearbook: The Politics Cultures and Economies of the World 2012*, pp. 70-71, 2011.
- [3]. C. Wenzhi and L. Bai, "A smart roadside parking navigation system based on sensor networks for its" in IET International Conference on Wireless Mobile and Multimedia Networks, IET, pp. 1-4, 2006.
- [4]. Umapathi N., Sabbani S., Poovarasan S. (2022) Person Location Tracking Using Global Positioning System and ESP8266 with Internet of Things. In: Sivasubramanian A., Shastry P.N., Hong P.C. (eds) *Futuristic Communication and Network Technologies. Lecture Notes in Electrical Engineering*, vol 792. Springer, Singapore. https://doi.org/10.1007/978-981-16-4625-6_21
- [5]. N. Umapathi, C. Vyshnavi, K. Srilekha and V. Sahithi, "Monitoring of Crop Growth Parameters using Arduino and ESP8266," *2022 2nd International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET)*, 2022, pp. 1-5, doi: 10.1109/ICEFEET51821.2022.9848009.
- [6]. M. Handte, S. Foell, S. Wagner, G. Kortuem and P. J. Marrón, "An internet-of-things enabled connected navigation system for urban bus riders", *IEEE internet of things journal*, vol. 3, no. 5, pp. 735-744, 2016.
- [7]. Samaras, N. Evangelidou, A. Arvanitopoulos, J. Gialelis, S. Koubias and A. Tzes, "Kathodigos-a novel smart parking system based on wireless sensor network", *Intelligent Transportation Systems*, vol. 1, pp. 140-145, 2013.
- [8]. R. Kannadasan, A. Krishnamoorthy and N. Prabakaran, *Rfid based automatic parking system*, 2016.
- [9]. N. Umapathi, S. Teja, Roshini and S. Kiran, "Design and Implementation of Prevent Gas Poisoning from Sewage Workers using Arduino," *2020 IEEE International Symposium on Sustainable Energy, Signal Processing and Cyber Security (iSSSC)*, 2020, pp. 1-4, doi:10.1109/iSSSC50941.2020.9358841.
- [10]. Umapathi N., Sabbani S. (2022) An Internet of Things (IoT)-based Approach for Real-Time Kitchen Monitoring Using NodeMCU 1.0. In: Sivasubramanian A., Shastry P.N., Hong P.C. (eds) *Futuristic Communication and Network Technologies. Lecture Notes in Electrical Engineering*, vol 792. Springer, Singapore. https://doi.org/10.1007/978-981-16-4625-6_4