iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** V **Month of publication:** May 2023

DOI: https://doi.org/10.22214/ijraset.2023.51780

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue V May 2023- Available at www.ijraset.com

Navigation and Reservation Based Smart Parking Platfrom For Smart Cities

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Abstract: ***In the modern era of technology, smart devices are becoming more common in everyday life. To find a free parking slot is the most difficult task in our cities The principal role of this research paper is to analyze smart parking solutions from a technical perspective, underlining the systems and sensors that are available, as documented in the literature. In this paper we have proposed a navigation and reservation based smart car parking system. The proposed system is being controlled by an app so as to reduce human intervention. To book the slot for parking is being done with the help of web application, some amount of charges is deducted through wallet. We can navigate to the reserved slot location by using google map. The proposed method makes our life more easier and hassles free.***

Keywords: Sensors, LCD Display, Web application, Servo Motor, IoT (Internet of Things), NodeMCU

I. INTRODUCTION

In many situations, driver faces difficulty to find a parking slot or check whether vehicle parked at proper location or not. To tackle all these problems, we must convert the conventional parking system to Smart Parking System in which parking is done automatically by our android application. This smart car parking system is used for real based car parking system. We introduced smart parking system in which navigation, reservation and online payment is done through web application. The work of this project is based on web application, where several sensors are connected to Application through NODE MCU.

The aim of our project is to make the parking system much simpler and automated in order to provide more reliable and easy parking platform. This project can be implemented in metropolitan cities at various situation and places such as schools, shopping malls, cinema halls, colleges, hospitals and many more places. With less requirement of maintenance for better functionality of the parking slot.

II. LITERATURE REVIEW

Shashank Shenoy Basty, Rajeshwari Kiwad, Srikanth Vittal, Mohammad Moin Ullah,2022.[1]

This is an RFID based smart car parking system using Arduino Uno, in which only authorized persona with valid RFID card will have access to the Parking Lot. When the circuit is switched ON, information about the availability of slots is displayed on the LCD display with the help of IR sensors placed in each slot the information about the occupancy of slots is displayed on the LCD display.

Naman JatinBhai Shah, Sejal Thakkar, 2021.[2]

RFID based smart car parking system using Arduino Uno, in which only authorized personal with valid RFID card will have access to the Parking slot information of slots is displayed on the LCD display. If the card number is matched with saved number in the database, the Arduino will allow the car to park in the secured area. With the help of IR sensors placed in each slot the information about the occupancy of slots is displayed on the LCD display. A welcome message with the name of the card holder is also displayed on the LCD display. As the car enters and exit, information about the free slots i.e., the free slot number is displayed on the LCD display.

MinalPatil, KrushnaChetepawad, Ashwanikumar Shahu and Shivshankar Swami, 2020. [3]

As the car comes in the parking zone, the RFID card is scanned though the RFID card reader at the gate in which each user had different ID. The RFID reader will take out the cars registration number. The system then checks whether the owner of the car has any particular parking space druthers or not. At the same time the count of available slot will be decremented by one. The most beneficial parking space available is distributed to the car and the same is showed on an LCD panel. This will be reflected on to the website so that another user can be able how many slots are available. Time of entry is reflected into the system. Before coming to the parking zone the user can be able to book the parking slot in advance using website with their own user id and password and the booking amount will be deducted from the owner's balance.

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When the vehicle exit, Exiting time the count of the available slot is increases by one and depending upon the time vehicle parked on the basis amount will be deducted from the user account. The parking cost is shown on the LCD panel.

Prathibha G, Mamatha K , Meenakshi H S , Roja K, 2020 [4]

In this parking system customers finds an easy way of reserving a parking space online. There is reservation system where users can view and select the space whether space is available or not. If the space is available then the user book it for specific time slot. The booked space will not be available for anyone else for the specified time. There is a feature of cancelling the bookings through which user can cancel their booked space anytime. Users can make payment online. Unique parking number will be sent to user via SMS on his/her phone after booking

But, In this system navigation is not available which helps the user to reach the parking area on time. So, In our project we are doing navigation and reservation both and payment gateway is also available

III. METHODOLOGY

The proposed system deals with advanced parking management system, the automatic parking space detection system has been introduced in the new form. Computer vision researchers contribute in this field to make it fully automatic . Proposed system can recognize the occupied and vacant parking slots which may reduce the human efforts. In this real-time information is sent through which vacant parking slot or space can be detected which is implemented with new technique. The system is also capable of recognizing that the vehicle has been parked or not. Seeking a vacant parking space during peak hours in areas like Hospitals, Hotels has always been frustrating for many drivers. Surveys says that traffic generated by cars searching for vacancies in Parking Spaces is up to 40% of the total traffic. There is reservation of parking slots available through which driver have to reserve the slots after reservation payment is to be done through wallet option which also saves time and fuel of the driver. After reservation and payment customer id number is generated The Smart Car Parking System like this helps drivers make smart decisions which will reduce congestion To find a parking space has become a daily concern these days, and that is where the motivation for this project came up from.

IV. MODELING AND ANALYSIS

A block diagram shown in Fig. 1, gives a brief working of the proposed model of navigation and reservation based smart car parking platform for smart cities in which we are showing web application based reservation of parking slots and navigation to the reserved slot using google Map. In this online booking is done through app, payment is automatically deducted from the wallet and we have to recharge our wallet using payment gateway. Through Node MCU controller we are controlling servomotor, IR sensor and LCD display in which the work of IR sensor is for sensing the vehicle and verify its status to the web application, LCD display is used to show the status of parking slots either it is free or it is parked and the working of servomotor is used to sense the vehicle and open the barricade.

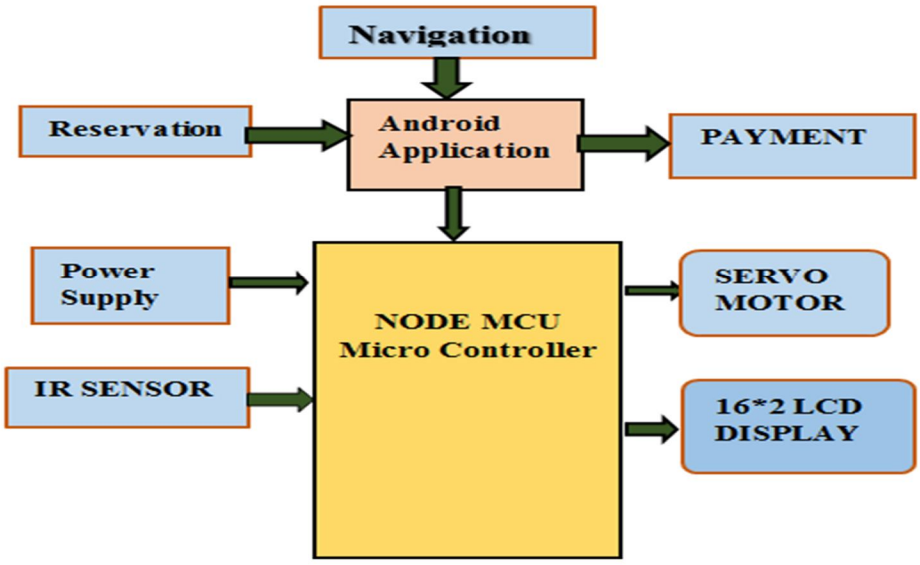


Figure 1: Block diagram of Navigation and Reservation Based Smart Parking Platform

Working Process

1) Online reservation of slot using NodeMCU through web application.
2) Reservation is done for some time duration in which we have to park the car.
3) Navigation to the reserved slot is done through Google Map.
4) After reservation some amount is deducted automatically from the wallet.
5) Recharging option is available.
6) Parking slot status shown on the app.
7) If person park their vehicle on time sensor takes the input and verify parking status.
8) If person doesn't park their vehicle on time then amount will be refunded.
9) LCD Display shows the parking status.

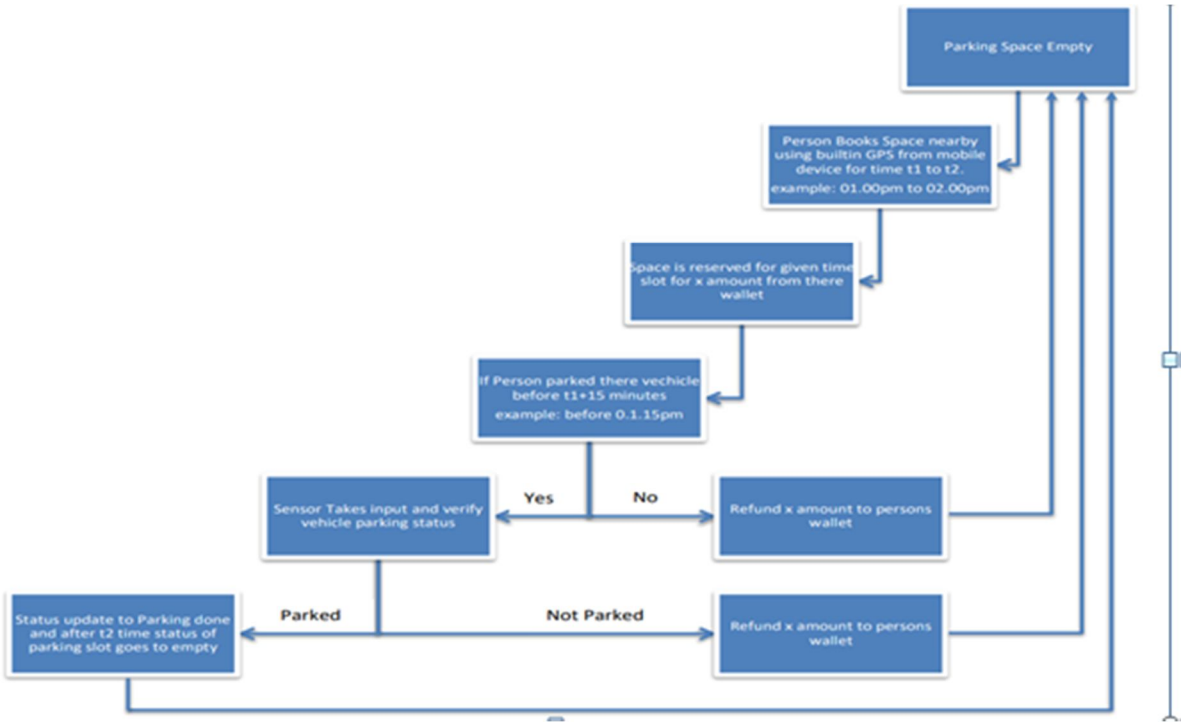


Figure 2: Flow chart

V. RESULTS AND DISCUSSION

User reserve the parking slots using web application after reservation amount is deducted automatically from the wallet of the user. User have to recharge the wallet for future booking purposes and information of parking spaces is shown on the web application. Navigation to the reserved slot is done through Google Map. Customer ID is generated for authorized access of the user there is LCD display to show the state of parking slot. There is IR sensor which can sense the parking slot status and verify it to the user If user didn't reach in time duration in which reservation is done then the reservation amount will be refunded to the user wallet.

Table 1. Comparison of the Proposed model of Smart Parking with earlier published models of Smart Parking

S. No.	Features	Reference Number/ Published Year				Proposed Model
		[1]/ 2022	[2]/ 2021	[3]/ 2020	[4]/ 2020	
1.	Authorized access	Yes	Yes	Yes	Yes	Yes
2.	Method to identify the person	Yes	Yes	Yes	Yes	Yes
3.	Availability of slots is already known by the driver through web application.	No	No	Yes	Yes	Yes
4.	Reservation of the slot	No	No	No	Yes	Yes

5.	Payment method	No	No	Yes	Yes	Yes
6.	Recharging option and Refundable option	No	No	No	No	Yes
7.	Navigation to the reserved slot	No	No	No	No	Yes

Yes: Availability of the feature
No: The feature is missing

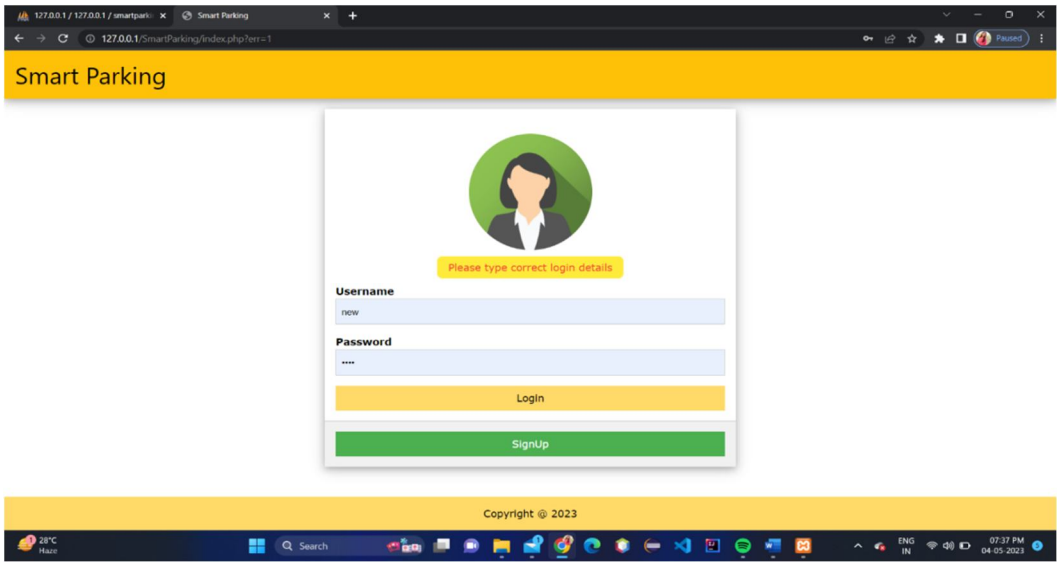


Figure 3: Login Page of our web application

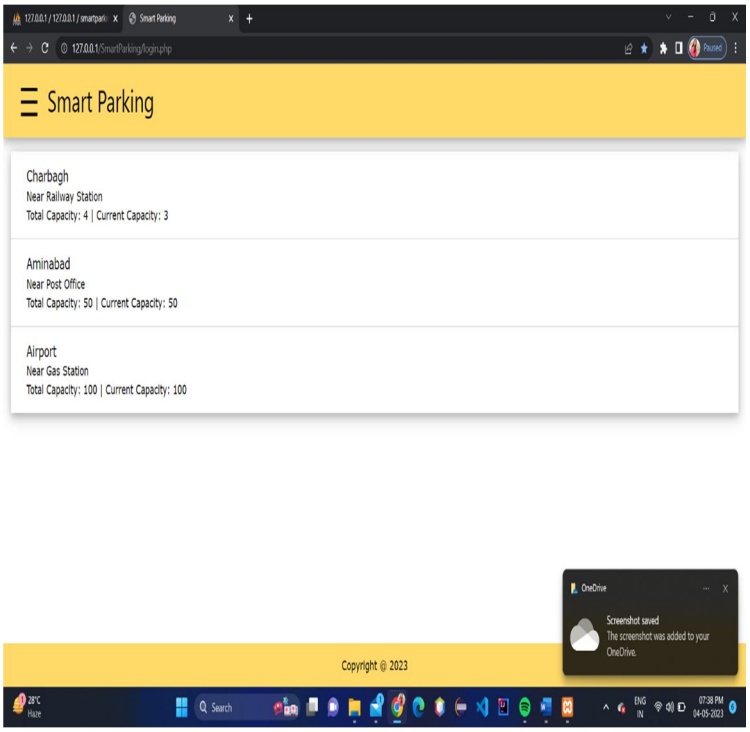


Figure 4: Parking locations with their capacity

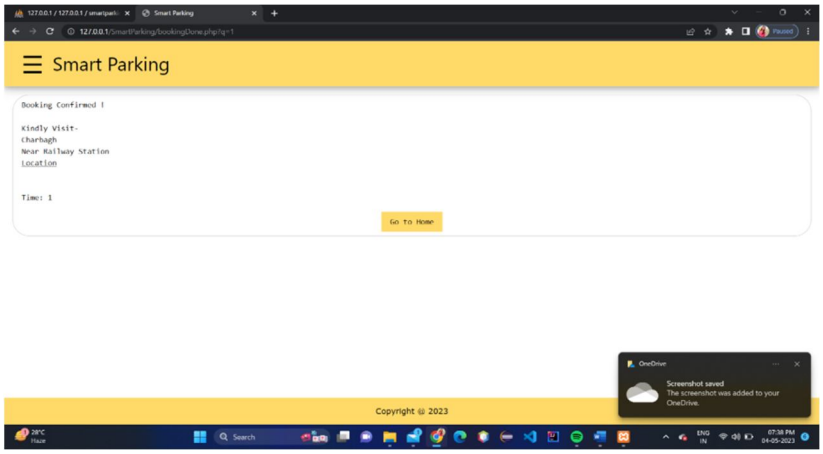


Figure 5: Booking Confirmation Page

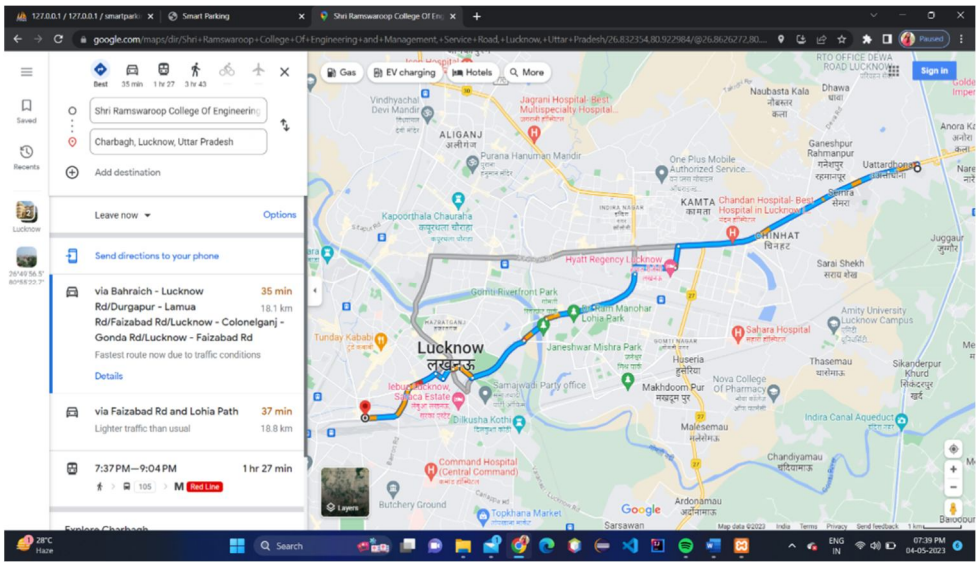


Figure 6: Navigation to the reserved slot

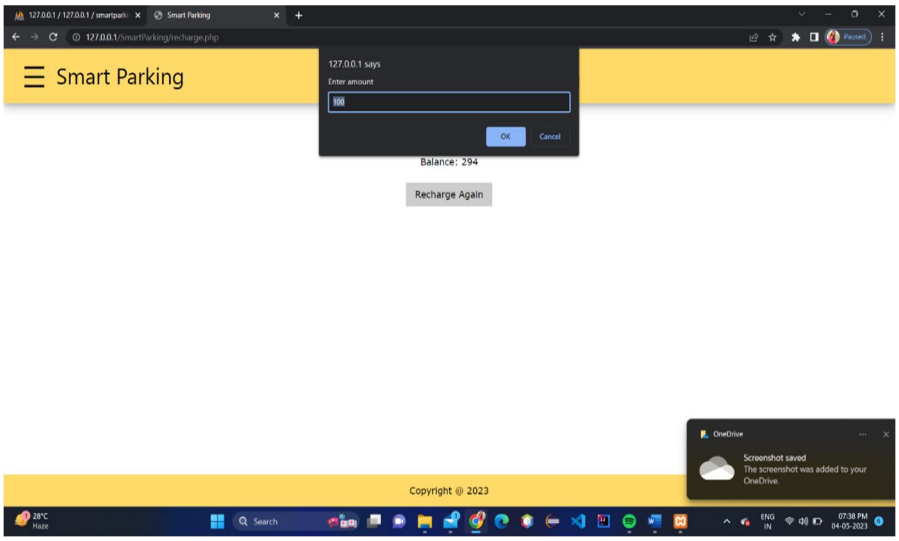


Figure 7: Recharging option

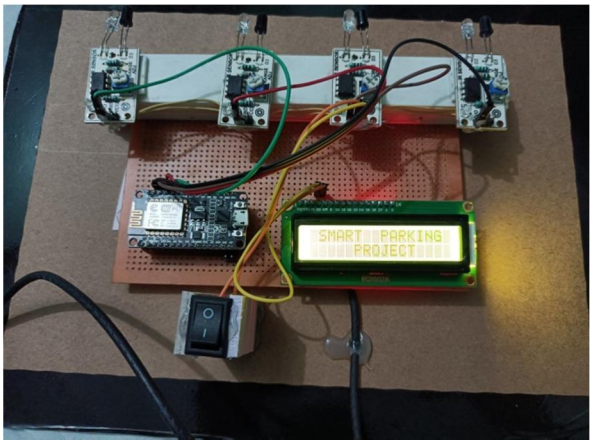


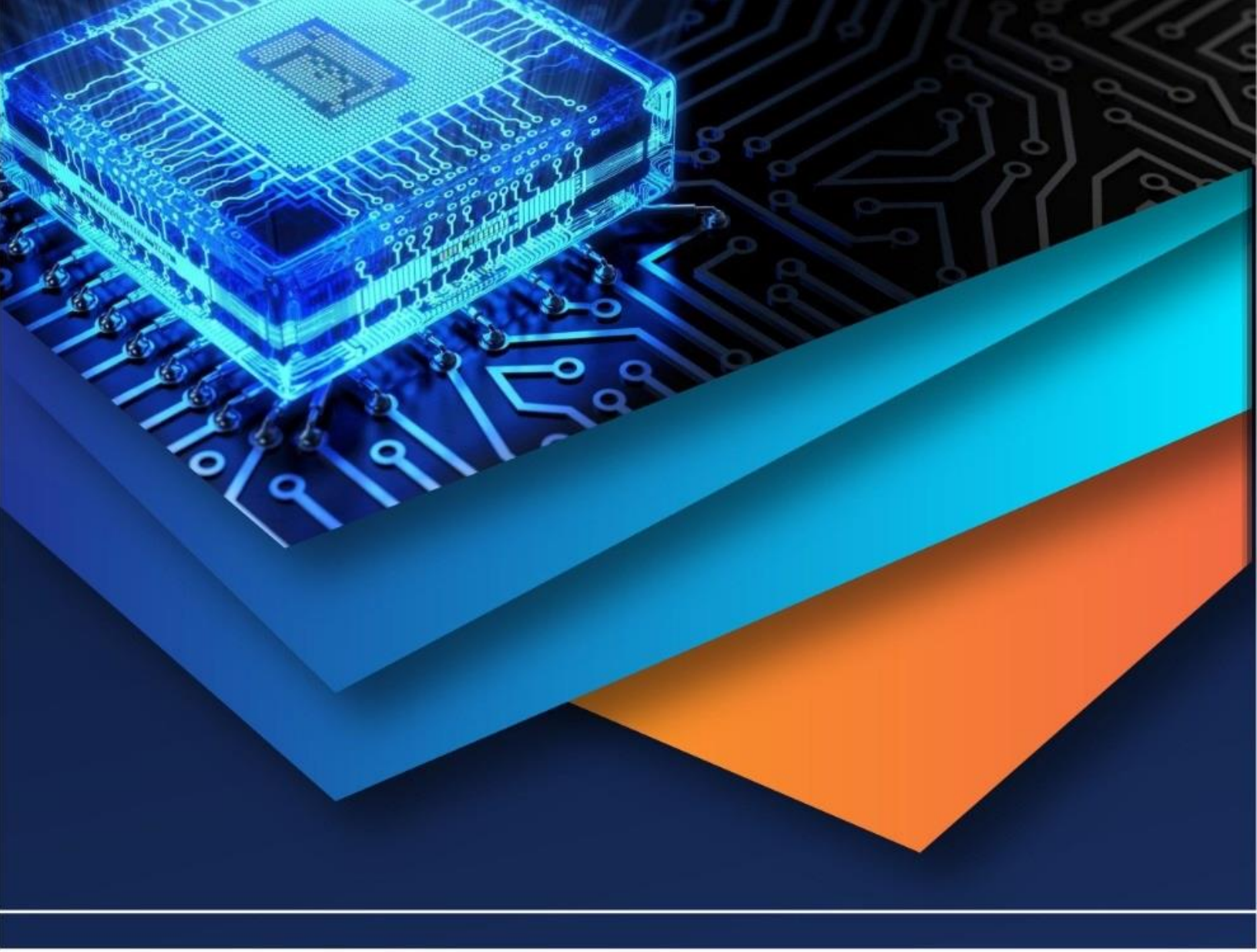
Figure 8: Hardware connection

VI. CONCLUSION

To make the city a smart city we always have to work on its parking facilities and its traffic management system in this we provide information of the availability of parking slots in a parking area in real time. User from remote location could use mobile as well as web application to book a parking slot for them. In this navigation and reservation-based car parking along with online payment is introduced in which we have to find the nearest parking slot in the smart cities, after reservation unique ID is generated using which user will enter into the parking area. The aim of the system is to provide methodology and to provide authenticity and security to the user which basically ensures less traffic in the city, safe and secure parking of our vehicle and reduce the time consumption, availability of spaces will be informed to the user and allow them to reserve if user doesn't reach the parking area at the reserved time then the reservation will be cancelled after sometime .This makes the life of the vehicle user a lot more comfortable and saves his valuable time and fuel consumption The efforts made in this project is just to improve the city's parking facilities and this aims to improve his people's quality of life.

REFERENCES

[1] Shashank Shenoy Basty , Rajeshwari Kiwad, Srikanth Vittal , Mohammad Moin Ullah," RFID based Smart Parking System", International Journal of Engineering Research & Technology (IJERT) Vol. 11 Issue 07, July-2022
[2] Yash Agarwal, Punit Ratnani, Umang Shah, Puru Jain, "IoT based Smart Parking System", Intelligent Computing and Control Systems (ICICCS) 2021 5th International Conference on, pp. 464-470, 2021.
[3] Naman JatinBhai Shah, Sejal Thakkar(2021): "RFID Based Smart Parking System", International Research Journal of Engineering and Technology (IRJET), p-ISSN: 2395-0072
[4] Sneha George, Amal.V.S,Antony Pavu, Neeraj.V.N, "Smart Parking System with Automatic Payment", International Journal of Advanced Research in Computer and Communication Engineering(IJARCCE),Volume 10, Issue 01, January 2021
[5] Abd Kadir, M. M., Osman, M. N., Othman, N. A., & Sedek, K. A, "IoT based Car Parking Management System using IR Sensor", Journal of Computing Research and Innovation, Volume 05, Issue 02,2020.
[6] Minal Patil Krushna Chetepawad Ashwanikumar Shahu and Shivshankar Swami, "IOT based smart car parking system", International journal of advance Research Innovative ideas in education (IJARIIE) 2020.
[7] Prathibha G, Mamatha K , Meenakshi H S , Roja K "Android based parking booking system",International Journal of Innovation Research in Science ,Engineering and Technology(IJIRSET) Volume 9 , Issue 06, June 2020.
[8] Agustina ampuni, Adi Fitrianto, Gunawan Wang, Sopater Fonataba,"Smart Parking System with automatic Cashier machine Utilize the IOT Technology", in 2019 IEEE International Conference on Internet of Things
[9] P. Melnyk, S. Djahel and F. Nait-Abdesselam, "Towards a Smart Parking Management System for Smart Cities",2019 IEEE International Smart Cities Conference (ISC2), Casablanca, Morocco, 2019, pp. 542-546.
[10] Ankita Gupta, Ankit Srivastava, Rohit Anand, Paras Chawla (2019): "Smart Vehicle Parking Monitoring System using RFID", International Journal of Innovative Technology and Exploring Engineering(IJITEE), ISSN: 2278-3075



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