Controlled Parking System by Checking Slots

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Abstract- Increasing the population leads to increases the number of vehicles mostly in urban areas. Day by day vehicles are increasing rapidly we are facing the scarcity to park a vehicles mainly in traffic congestion areas. We are having many parking related problems in existing parking methods. In big malls, hospitals, railway stations, bus stands, air ports etc. in some more places we are facing the problem of not availability of parking space to park their own vehicles. In existing parking system the driver has to check where he have the space to park his vehicle, it is a time taking process an every time the driver has to check the availability of parking space to park their vehicle. Earlier some of the parking systems maintain token process to park the vehicle but still some issues in parking system has not resolved. In existed car or vehicle parking system we are facing insufficient parking space. We want to maintain a well-designed parking space to make the drivers easy to park the vehicles. So we should maintain an efficient parking system to park the vehicles.

The problems involved in current parking systems has been solved by maintaining a sufficient parking space which reduces less time to park our vehicle and easy availability of parking slots to the driver. Here we are using a best technology which reduces traffic problems called RFID. In this we design a smart car parking system using radio frequency identification.

In this we should maintain enough parking slots to park more vehicles in an order. So we can solve all the existing problems in parking system using RFID technology. By using this technology we can easily identify the vehicles and this technology will also shows the river where he has to park the vehicle and in which slot he has to park. In this RFID plays a major role in parking. This reduces the traffic issues in parking the vehicles. Here our vehicle is car. This a best technology to maintain a well control parking system.

Index Terms- Arduino Nano, Servo Motor, IR proximity sensor, 16*2 LCD display, RFID–Module.

I. INTRODUCTION

In this we are introducing the RFID car parking system which is the best parking method to park our vehicles and several slots are available here to park large number of vehicles in a well-organized manner. Radio frequency waves which are used to communicate the data between the reader and the tag. In this we use Arduino Nano to control the connected devices to it. This technology will solve all the existing problems of parking system. It is a best way to park the vehicles without the time delay. The radio frequency identification is a way to park vehicles. In this first the LCD display will says welcome to the river when he enter into the parking space.

This RFID has two things the RFID reader and RFID tag, the tag is used to scan the reader, the reader checks if the tag is recharged or not, we have to recharge the less amount to park the car then after recharging the card will activated. We have to scan the tag two times, once at when the car or any vehicle is entering into the parking space and another time at when the car is leaving the parking space. After scanning the tag at entrance the servo motor lifts up the gate and allow the driver to enter into the parking space to park your vehicle in particular slot. When once again after scanning done at exit the servo motor lifts up the gate and allow you exit the parking area. The IR sensors are placed at every slots it will detect the object and whether the slot is empty or full and sends the information to the LCD display will displays the information about parking slots. Another LCD display also present at exit it will display thank you command. The RFID reader module store the information of the tag.

Introducing this type of technology in car parking system involves mainly this process is done automatically it doesn't need any person to check and record the information at every particular period of time. It reduces the time of parking. It reduces the traffic between the vehicles. This is the best and systematic manner of parking the vehicles. This parking

system is more secured. The main aim of using RFID in parking system is it consists the information of the vehicles for a long time, it will resolve all the problems in current parking system. If we implement the RFID parking system more in big malls, hospitals, railway stations, bus stands the traffic problems will decrease completely. This the best method to park our vehicles in a smart way. Hence it is called as smart car parking system. This parking system provides the driver more space to park their vehicle and it will allocate the particular slot to the driver in order to reduce the confusion for the driver to select a slot. For this parking system the parking cost is less. The LCD display will displays the status of the parking slots at every minute. It displays information when all the slots are filled and when all the slots are empty and when which particular slots are filled. If in general the driver has to check for the parking space to park his vehicle but when we use this parking system reduces the searching time of the driver to park his vehicle.
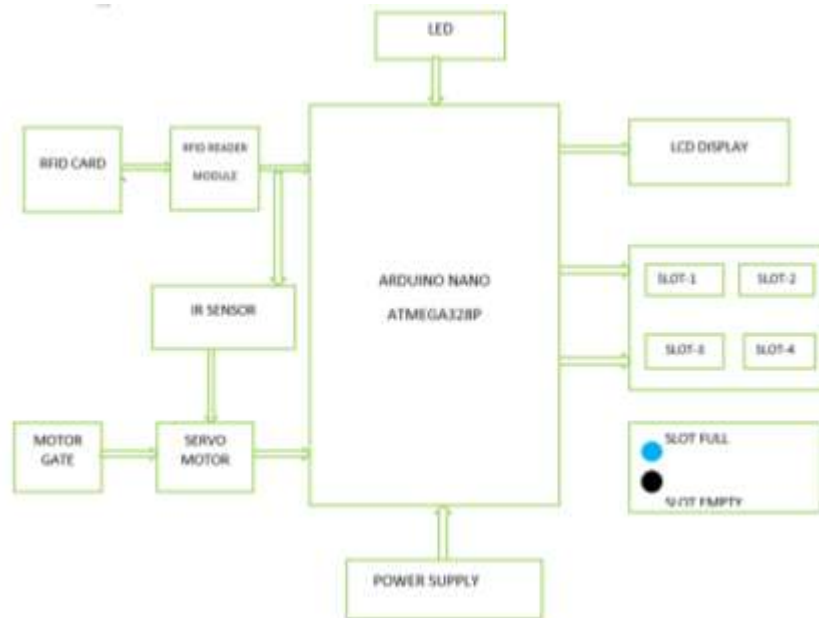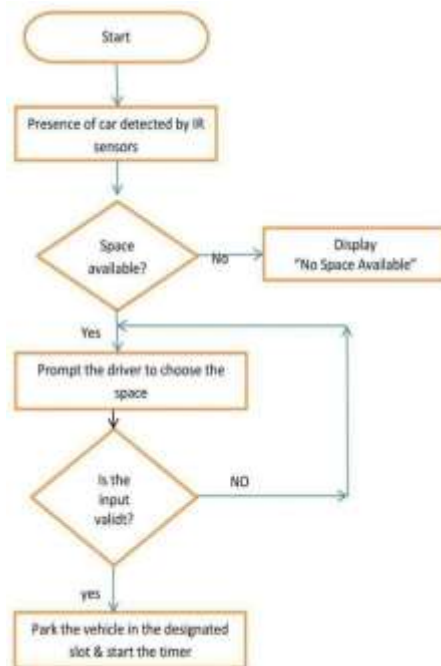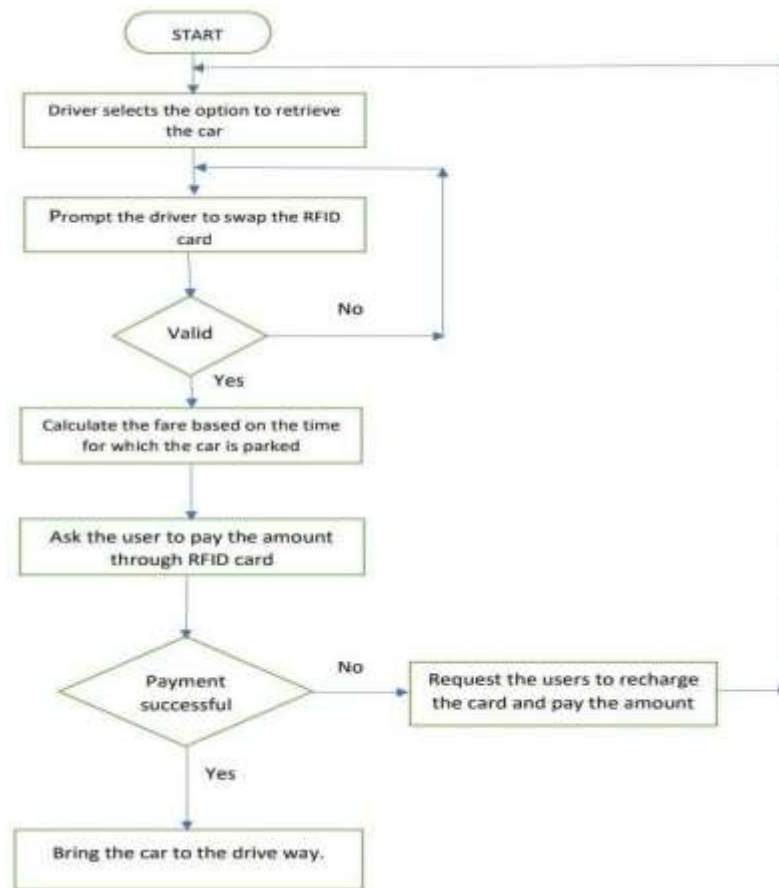

Figure-1: Block Diagram of Controlled Parking System

Research Elaborations
   (i) Flowchart

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Figure-3: Flow Chart of Car Check-Out

(ii) Algorithm

Step 1: Collect the required components

- Arduino Nano
- IR sensor
- LCD Display
- Servo motor
- RFID Reader module
- RFID tag

Step 2: Interconnection of all components based on circuit diagram.

Step 3: Give power supply.

Step 4: The car enter to the gate and the driver scan the RFID tag after that the gate will be open

Step 5: The car enter into the parking area the LCD display displays the information of parking slots.

Step 6: If the slot will be full it displays 1, other wise 0.

**Step 7**: The car exit from the slot the step 4 will be repeated.

Step 8: The LCD display displays the information about parked timings.

This technology also aims to decrease the number of workers needed in the garage. because a 7-meter counter to countdown is always present at the entry. While counting the exit in ascending order or in accordance with Arduino programming, it will also take into account how many vehicles are expected to be in the garage. When the metre reaches its maximum value, the

garage door automatically closes and cannot be opened until the next car pulls in. Several gadgets, such as the GPS's GPS depletion, that assist people gain time and lessen traffic congestion caused by protrusion can be incorporated to this projec t.

Results and Findings

Figure I and II represents the Installation of Controlled Car Parking System and the Check-In of the Car using the RFID Card. This process will be done by using the Arduino Nano Microcontroller.
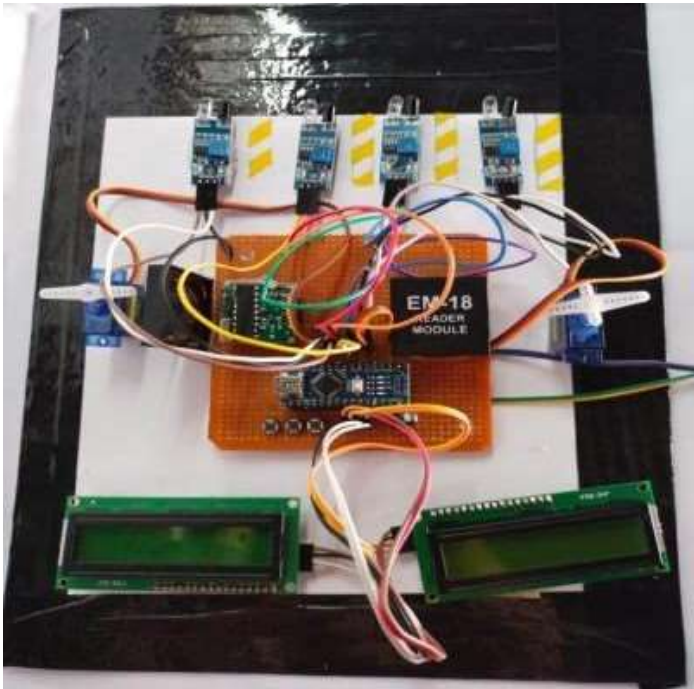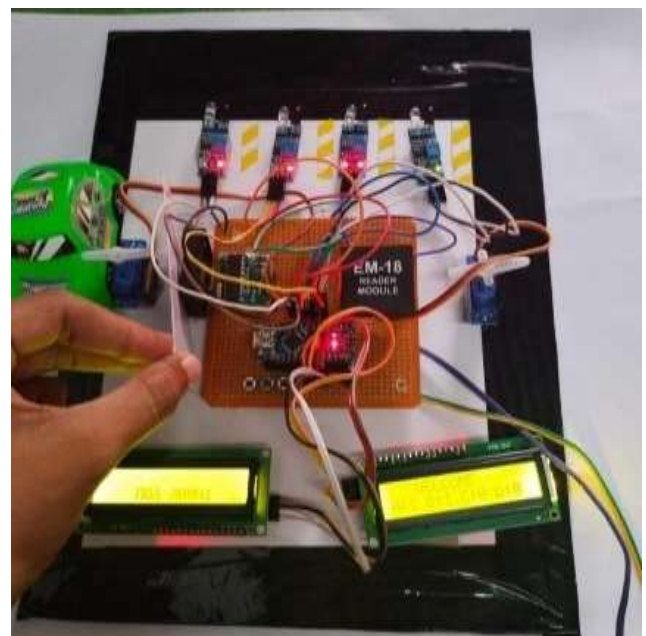

[I] Installation of Controlled Car Parking System Technology
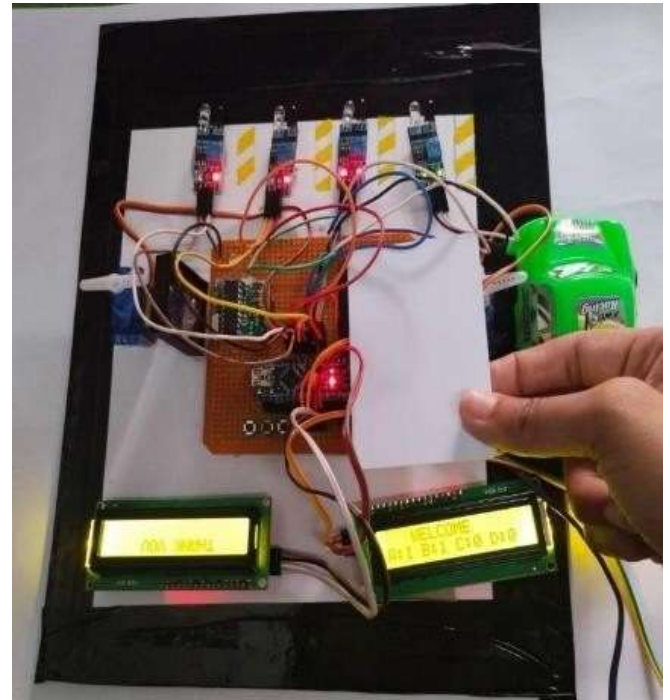
[II] Check-In the Car using the RFID

Figure III and IV illustrates the entering of the car by scanning the RFID card and the gates are opened & the check-out process of the controlled car parking system using RFID Technology

The RFID

This the car parking system using RFID module and coming to this there is an LCD display at the entrance which displays the information about car and parking space. If the parking area is filled with car it will show that particular slot is 1 and remaining all empty slots. If all the parking slots are filled then the LCD will display parking is full.

II CONCLUSION

The smart multi-storey parking system that was built as part of this thesis's control strategies is a great alternative to traditional parking lots. Because it can fit more cars in a smaller space than other existing designs, the concept is obviously efficient. The lifting mechanism is more efficient and less complicated. Information about the total number of cars that can be parked and the space that is available for parking is shown on an LCD panel. Dual IR sensors This project uses TX RX pairs to pinpoint the open spaces. This RFID-enabled paid parking system, which combines a centralised database system with RFID readers and cards, makes parking quick and affordable. In comparison to the conventional barcode-scanned or manned parking system, the technology guarantees shorter wait time at the entry and exit barriers of the parking lot. It is also a more cost-effective method. The Parking Allocation component has sensors in front of each slot, and whenever a car pulls in, the sensors update the database and the changes are immediately visible on the surrounding display. An RFID Tag is fastened to the car as part of the Seamless Parking system. the moment the automobile enters the building .This suggested design for a smart parking system would speed up the process of finding a spot and lessen instances of cars being parked incorrectly. Additionally, it lowers labour costs and manual labour requirements, requiring less investment in manpower and allowing for significant financial savings. The project's efforts aim to improve the city's parking infrastructure, which will ultimately improve the quality of life for its residents.

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