

IOT Based Smart Parking with Android Application for Pre-booking Parking

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Abstract: *Now-a-days, vehicle parking has become a major problem in urban areas with the shortage of parking spaces. it is very difficult and frustrating to find a parking space in most metropolitan areas, especially during the rush hours to solve this problem. The paper entitled smart parking system using android application, the major motivation of this paper is to reduce the traffic congestion in roads, multistorey buildings and malls due to unavailability of parking spaces. The proposed application provides an easy way for reservation of parking slot. In this application user can view various parking areas and also view whether space is available or not. If the booking space is available then he can book it for specific time slot. The paper displays the nearest empty slot if present with respect to user location. Our project aims to make efficient use of parking spaces. A cloud-based smart parking application will enable real-time monitoring and booking of parking availability by providing enhanced services to the end users as well as reduce the workload of the parking administrator.*

Keywords: Arduino, IR Sensor , DC Motor, Android Studio

I. INTRODUCTION

The number of personal vehicles usage is increasing day by day. Due to this searching for a vacant parking area during peak hours is not only time-consuming but also results in wastage of fuel. The drivers keep searching for a proper parking lot that leads to increased traffic. Increasing volume of vehicular exhaust creates a negative impact on the environment. Hence reservation-based smart parking has become the need of the day. At this time, most existing parking lots do not have a system in place. Most of them are managed by hand and are a bit ineffective. Every user's demand should be I. Should be more efficient ii. Users friendly iii. They should provide more security. The idea behind our Android Application- "valid spot" is to help the user for online parking booking. The Smart Parking Application aims at helping users to find the most suitable area for parking, make reservations and extend them, if required. In this application user can view various parking areas also he can select it to view whether parking slot is available or not. If the parking slot is available in parking. We plan to broaden the testing on the real-time environment where users can have the "Smart Parking" system in their portable devices.

II. LITERATURE SURVEY

Now-a-days technology has been moving fast in all stream, with that people are moving forward with the time. To save little bit of time of people of car parking as well help them to park the car in legal space not on road and not becoming the frustrated for finding the space for car, this application the "The Smart parking Application" has been introduced. "Parking system controlled by Android application" is a miniature model of a car parking system that can regulate and manage the number of cars that can be parked in given space at any given time based on the availability of parking slot. For this topic, various papers are available with technology they have used from all this research of technology and information here are some paper which are associated with this topic. In this paper, smart parking systems obtain information about available parking spaces. process it and then place the car in that position. Automated parking is a method of parking an existing car using a sensor. Entry and exit of the order are done by android application.

III. OBJECTIVE

1. Design and develop an Arduino-based smart parking system aimed at optimizing parking space utilization, enhancing user experience, and reducing traffic congestion.
2. The system should accurately detect and monitor parking space availability in real-time,
3. Management of parking resources through sensor
4. Android application for detect and parking slot allocation

IV. TOOLS AND TECHNOLOGY

Due to hardware project we use embedded C

HARDWARE DESCRIPTION

Arduino:

Arduino is the main part or brain of our system. Arduino is a simple microcontroller board that used to make computers that drive all the function and creative projects a like.

Now A smart parking system using Arduino can utilize ultrasonic sensors to detect the presence of vehicles in parking spots. Each parking spot would be equipped with an IR sensor connected to the Arduino board.

IR Sensor:

In a smart parking system, IR (infrared) sensors can be used for vehicle detection in parking spots.

IR sensors play a crucial role in smart parking systems by enabling accurate detection of vehicle occupancy, facilitating efficient management of parking spaces, and enhancing the overall user experience.

DC Motor:

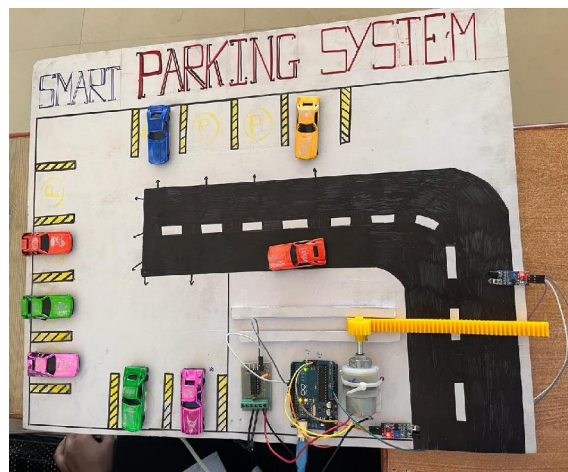
In a smart parking system, a DC motor can be used to control the movement of a barrier arm or gate at the entrance and exit of the parking lot.

DC motor into a smart parking system provides reliable and efficient control over the entrance and exit points, enhancing security, convenience, and automation for both users and parking management personnel.

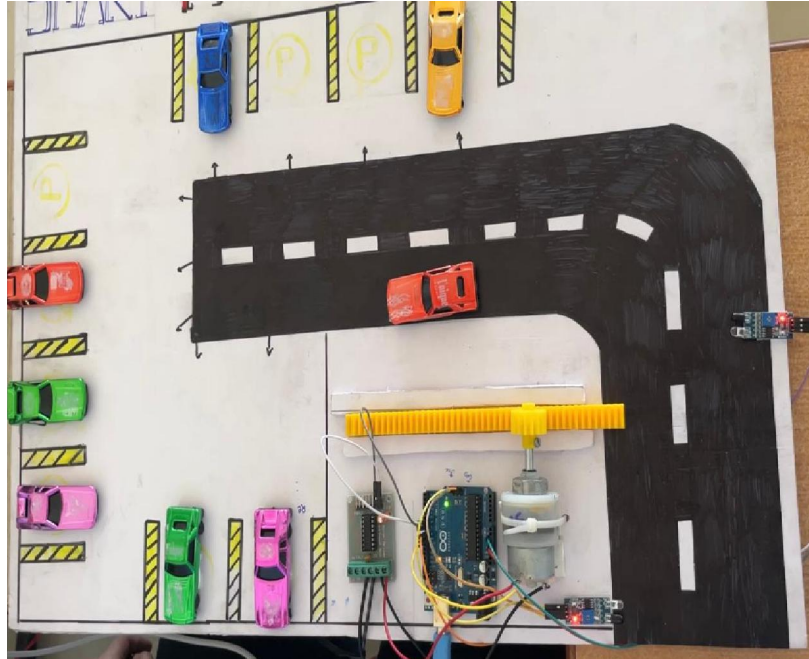
V. MODEL

5.1 MODEL

5.1.1 Closed Gate



5.1.2 Opened Gate



VI. ADVANTAGES AND APPLICATIONS

6.1 ADVANTAGES

- Efficient space utilization
- Reduced congestion and traffic in parking areas
- Convenient prebooking option for users
- Real-time space availability information for better planning

6.2 APPLICATION

- The system can be used in various Parking Area.

VII. CONCLUSION AND FUTURE SCOPE

The main intention of this research is to step further is the evolution of smart city by developing a smart car parking management system using Internet of Things. IoT is the current trending area in technology which will be the foundation for the concept of future smart cities, used to access the information remotely. Present days everybody uses smart phones and internet, so online booking provided solution to the predicting parking space issue and user can pay parking fee online.

The parking management provided solution to the perfect parking and reduces resources on finding a parking slot. the future of smart parking holds immense potential for transforming urban mobility and enhancing the quality of life in cities. By leveraging cutting-edge technologies, promoting sustainability, and prioritizing user-centric design, smart parking systems are poised to revolutionize the way we park and move within urban environments, ultimately contributing to more efficient, sustainable, and livable cities.

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