

Real Time Smart Parking System Using IoT

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ABSTRACT

In this rapid-growing economy, the number of car users are rising sharply in search of more parking. The full presence of a smart phone encourages users to choose solutions designed for the mobile app. The growth of Internet of Thing has covered the path for the combination of different mobile devices, wireless communication devices and technology and also mobile web applications. In this research paper we propose a "Real time smart parking system using IOT that integrates with the Web system. Provides a complete parking solution for both user and parking owner. Features are provided to save the parking space, confirm the saved user, identify the nearest available space according to the size of the car, navigate the parking area and calculate daily, weekly and monthly account details. Infrared (IR) sensors are used to recognize when parking is unoccupied.

Availability of free space with location information is distributed using WIFI module technology, microcontroller and wireless communication technology to the server and is restored even using the Web. The QR code attached to the car is used to confirm the user who keeps the parking space for an hour, daily, weekly or monthly. The design algorithm is used to recognize the closest unoccupied parking area based on the size of the motor vehicle. The owner of the parking lot can get statistics on the number of free and available places for the given time, the average weekly and weekend stay and the amount collected over a period of time and can use it to adjust variable parking fees. The mobile app is designed to provide a rich customer experience.

Key words: IoT, IR Sensor, QR Code, Slot searching and allotment.

1. INTRODUCTION

Internet of Thing has the capacity to carry data over the network without require human reporting. Internet of Thing allows the user to use wireless technology and also helps the client to move data to the cloud. IOT helps the client to hold on it see-through. The IOT idea begin with the possession of connecting devices for different devices. These devices can be managed online.

IoT consists of two prominent words "Internet" and "objects", in which the Internet is a large network to connect servers and devices. The Internet makes information sent,

received or communicated to devices. In different big cities & private enterprises, an empty parking lot is difficult to discover. As the number of motor vehicles expands, it becomes more complex and more time wasting to find accessible parking spaces.

The difficulty of traffic blockage happens not only on roads but also in parking area where parking is finite. A quality international city plans as well as India need smart parking facility that can help client to discover available parking so they cannot waste time and traffic issue. But, most of the provided parking areas are considered "informative parking areas" rather than "intelligent parking" because it only supplies information about parking area and the number of reserved areas in that parking area but can't discover the exact unoccupied parking space.

In most present systems, the user has to drive around the parking area to find an unoccupied slot. According to a study by Boston University, more than 32% of drivers take about 8-9 minutes to park their motor vehicle. According to recent survey in Bangkok, user can take up to 35 minutes to park their vehicle in busy areas such as Airports, super shops, colleges, and public areas.

According to survey from many parking Areas in world, the time consumed in the parking activity is generated by the time spent at the lock gates where the user must acquire a parking swipe card at the entrance and must pay parking fee at the exit and time to find occupied slot. In addition, in this activity, there is another point of torture that can happen when a user fails to recall his parking slot and has to drift the multi-stage space to find his vehicle, which is also time wasting.

So, in this paper, we suggest a solution to this issue by launching a "Real time smart parking system using on IoT, computer eyesight and web application to provide smart facility such as, discover real-time parking, finding a number plate of a car, recording stationary parking, calculating parking fees and allowing cell phone payments.

2. LITERATURE SURVEY

Different perspective is general in the expansion of intelligent or individualistic parking systems. To working of these systems, show that these needs less or no human interaction in order to function.

One of the smartest car parking plans is proposed using image processing. In this program, a brown circular image in the parking lot is captured and processed to find a free parking space. Details about currently available parking are shown in the 7- segment display. At first, a picture of the parking area with a brown circular representation is taken. The representation is break to make binary images. Audile is removed from this picture and object framework are followed. The image acquisition module determines which objects are round, by measuring the location of each object and the rotation. Therefore, free parking is provided.

The Number Plate Recognition process for developing private car parking uses the basic of image processing processing vehicle numbers. In this program, a picture of a vehicle license number is available. It is further divided to find each letter on a number plate. Ultrasonic sensors are used to locate free parking spaces. Then the number plate images are taken and analyzed. At the identical time, the present time is well known to compute parking costs. The LCD screen the 'FULL' sign to show that parking is not accessible. But some controls on the system as well as framework color compulsorily white and black. Also, the survey is restricted to number plates with only one line.

The Real time Smart Parking system is structured to raise the model of machines with image processing space. The vehicle would be parked using a lift on most stages. Also, image processing is used to scan a number plate of vehicle and store it in a system database to compare to stop traffic conjection. So, we suggest a Real time car parking system that shows a fully self-moving model with less human interconnection and control the restriction of existing systems.

3. SYSTEM ARCHITECTURE

In metro city, people favour a public transport as going to restaurant, malls or movie theaters. Discover a parking area in a heavily populated spaces can be wasting of time and fuel-consuming in between a search. So, we require smart solution, which will provide the different available of parking areas to a temporary user as well as permanent user.

The web application will permit client to registered for this facility and once the location and estimated arrival time is specified, the application require to get free parking slot and share the google location to the client. The client pays an online payment to reserved a parking space.

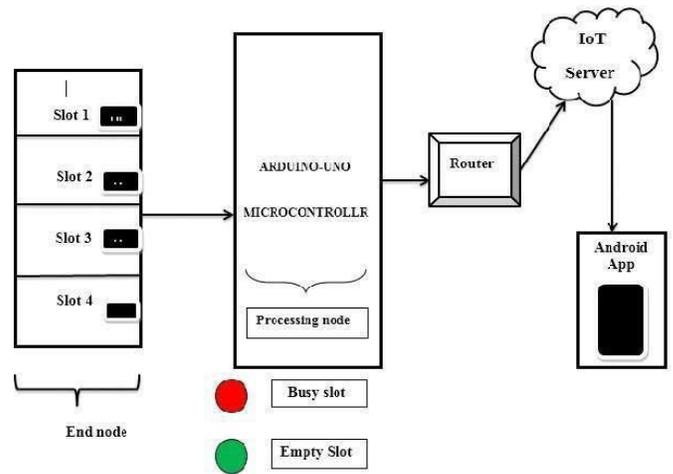


Fig. Architecture

In above fig, show the architecture of “Real time smart parking system using IOT. For each and every parking area, IR sensors are connected and Infrared (IR) sensors would disclose the vacant and unoccupied number of parking slots, Number vacant and reserved slots are displayed in LCD Display, WIFI module is required for transmission between web application and sensors. In above Figure shows a disclose of unoccupied parking slot and transmission between Wi- Fi to Arduino.



Fig. Structure of Deducting Empty Parking Space

4. SYSTEM FEATURES

A. Modules of System

1. User Registration: Here User have to register with required parameters such as name, mobile, password and hardware ID.
2. User Login: After user registration done successfully user can login to the system.
3. Slot Allocation: After successful login of driver or car user, the system will allocate the slot with slot number to the user for car parking.

4. Recommend Slot as Per ML(Algorithm): They will also recommend the slot to the user as per ML algorithm.
5. QR Generation: After successful payment Unique QR code will be generated.
6. Get Notification: The user can get notification message of allocated slot with the slot number.

B. Requirements of System

1. Hardware Requirements:

- RAM: 512 MB
- HDD: 160 GB
- LAN Cable
- Mobile Phone
- Arduino Uno

2. Software Requirements:

- Windows OS
- Android
- Java
- MySQL
- Arduino software

C. Applications

The Real time smart parking reservation system can be implemented in:

- Shopping Malls
- Restaurants
- Theatres
- City Areas
- Huge Parking Areas

7. CONCLUSION

In this paper, the execution of the "Real Time Smart Parking System using IoT" show by the Web Application is successfully discussed.

The elements used for project implementation provide effective output at different stages of execution. The transmission channels accepted between the different component provide effective communication throughout the working of the system.

Therefore, the structure works good and is suggest for business start-ups. In the upcoming year, definite changes may be made to the require of the corporation using the system. These are: - Discover for vacant parking slots can be improve using Binary or Hash Searching algorithm.

The structure can be expanded to multi-lateral spaces and multiple parking spaces by making feasible changes to

hardware setup. Notification pop-up deliver via Web application can be made secure by applying encryption algorithm. As well as, for security causes, sign in can be provided to clients.

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