

Smart Car Parking Application

Shivam Srivastava¹, Mohd. Azhar Hafeez², Pulkit Baranwal³

^{1,2,3}Student, Dept. of Computer Science Engineering, RKGIT Ghaziabad, Uttar Pradesh, India

Abstract - The aim of this paper is to provide a user friendly, reliable & automated car parking system. Nowadays as we can see that finding the space for parking can be considered as time as well as fuel consuming. Therefore it may cause driver to be frustrated which will lead to inappropriate parking. As a result the traffic around the parking space will increase and it can also lead to accident. In this paper, we design and implement application of Smart parking system. This app can be easily handled by the user through their mobile phones. To use this feature of parking the user firstly needs to download the app. Then after he/she has to register on that app using some personal details, after that he can easily get information about the available parking space and can book their convenient spot through the app only. This project will help to solve the problem of the user by allowing user to view and select available space in the parking. This app will be very much convenient and easy for the user as they can book the available space while sitting at home, which will prevent users from driving around the parking for long. As a conclusion, this project will help the user in many ways as it can reduced the amount of time a driver has to spend around the parking just to find the available spot. It will also reduce the traffic around the parking as well as the fuel which a driver burns in finding the space to park the vehicle.

1. INTRODUCTION

The rapid growth of the industrial world has its effect on the cars also. As day by day, the number of cars is increasing in number the traffics on the road is also increasing in the same way. As a result, there is no enough parking area to park the car. The driver spends much time as well as fuel while searching for the area to park the car. At last if he doesn't find the space, he parks the car in a wrong manner which leads to bad traffic. This is the situation is seen in most of the metro cities. People keep on moving searching the space so that they can park their car. This system of smart parking regulates a number of vehicles to the nearest parking space at any given time based on the parking space availability. This app 'Smart Parking' is implemented using the Android Operating System. The users firstly need to download the app on his mobile, then he/she needs to register on the app using some personal details. Then the user requests to show the parking space available near him or he/she can directly search the location by inputting the location manually through a keyboard. When user request, all the available free slots are displayed to the user. If the parking space will be available, the user is allowed to book the parking slot and proceed to pay. Now with the help of GPS a map on the screen is displayed which leads the way towards the starting of the parking area. Here the user will fix his slot by showing his confirmation details to the managing person at the

parking area. After Communicating, the user can follow its path to the allocated parking slot. After the vehicle is parked successfully the details will be reflected in the Administrator database. As a result the time of finding the parking area and burning the fuel while searching the area is reduced. After the car exits the parking the administrator manually makes the space available for parking. Thus this methodology reduces the user effort and time of searching a parking slot.

2. LITERATURE SURVEY

In the present scenario, various methods are prevalent for the event of a wise parking system. After studying these system we came to some extent that every system requires a touch or more human intervention to execute the method. Many of the parking systems were proposed, within which one in every of the systems is thought as a vision-based car parking system. This method uses two varieties of images i.e positive image and therefore the negative image to detect the parking slot. This method also uses the thing classifier to detect the desired object within the input. During this system, a positive image contains the image of the car while the negative image doesn't contain the image of the car. The coordinate is specified to the parking lots which is employed as an input to detect the presence of the car within the region. However limitation may occur within this method with relevancy the sort of camera used and also the arrangement used selects the actual parking location and to implement all this we've got to mend the placement of the camera. The second smart parking method is that the Number Plate Recognition technique. During this the system uses a picture processing basis to detect the amount on the amount plate of the vehicle. During this firstly the amount of the vehicle is acquired. Ultrasonic sensors are wont to detect the free parking slots. Then the image of the vehicle is analyzed. Simultaneously the time is additionally noted to calculate the fees. The LCD is additionally used which displays 'FULL' sign when the car park isn't empty. The limitation with this method was that the system includes background color being compulsorily black and character color white. Smart Parking system designed proposed a mechanical model with a picture processing facility. The car is parked with the utilization of lift at multilevel. Also image processing is employed to require a snap of the amount plate and store within the database for comparison to avoid illegal car entry.

Thus through this model we aim to present a model that's fully automated model with minimum human intervention and also to beat the limitation of this system.

3. TECHNOLOGIES USED

3.1 ANDROID

It is mobile operating system developed by Google. It is based on open linux kernel. Initially it was developed for mobile only and later on Android is also available for tablets, television, automobile etc. Development of Android Operating system was announced by google in 2007. In 2008, HTC launched the first Android mobile.

3.2 JAVA

Java is a programming language and a platform. It is a high-level, robust, and secured programming language. Its framework and classes make it easier for android development.

3.3 FIREBASE

It is a platform for mobile and web application development. It was developed by Firebase, Inc. in 2011, and then in 2014 Google acquired it. It helps us to develop high quality application and also helps to grow our business.

3.4 XML

It is a markup language that is readable by human and machine and was designed to store and transport the data. The World Wide Web(WWW) Consortium's XML 1.0 Specification is free open standards that define XML.

4. MODULES

This Application will consist of the following modules:

4.1 ADMIN

In this module, all things will be controlled and will be managed by the admin.

4.1.1 LOGIN

The admin manages all the bookings.

4.1.2 ADD SLOTS

In this the admin will add parking slots with all the information.

4.1.3 VIEW USERS

Here the admin can see all the users that have registered into the application.

4.1.4 VIEW BOOKING

Here the application will give all the booking information against start and end dates as inputs.

4.2 USER

This module is designed basically for the user purpose.

4.2.1 USER LOGIN/REGISTRATION

First the users have to register themselves to login into the application.

4.2.2 BOOK PARKING

The user will be able to select the parking slot from the empty slots and can book them.

4.2.3 PARKING AVAILABILITY

The slots will be marked as red if they are pre-occupied otherwise it will be shown white to the user.

4.2.4 COST CALCULATION

The system will calculate the total cost incurred for parking based on the time the user has booked for parking.

4.2.5 PARKING CANCELLATION

The user will also have the option to cancel the parking space that has been booked.

4.2.6 FEEDBACK

The application will provide the user with the feedback form for the application.

5. PROPOSED WORK

In this application, we are trying to reduce the problems the people face while parking as the number of vehicles is increasing day by day on the roads and when people don't get the parking space they park their vehicles in the wrong area which leads to traffic jams. There are several ways through which we can solve this problem. In today's world, almost everyone has access to the internet through their smartphones. So we are proposing an application through which the user can see the nearest parking area available in their location and can book the slot online on an hourly basis.

Through this android application we are proposing a fully automated model with minimum human intervention and it will also overcome the limitations of the present parking system. This Smart Car Parking Application is for online parking booking which will be implemented for customer's Reliability. This application will have two main modules one for the admin and the other for the user. The Admin will be responsible for adding slots for the parking, view the users who have booked the space, and can check all the details of the users. The user will be able to book a parking slot at the parking space available in the area through this application.

This application will enable us to make more efficient use of available slots in the parking area. This smart car parking application is based on client-server architecture. The client is provided with an android application for the process of pre-booking the parking slot. The Server-side processing will be enabled using Java and Firebase. The client will request the server for the parking space available in the nearby area and the server will respond with the slots available at the nearest parking space and will show the path to the client after the client will book the slot.

6. CONCLUSION

Smart Parking System is used to book parking slots in a very easy and efficient way using an android device. Through this application users can book parking slots without any great efforts. Through this app, user can check the slots which are available for parking and can book the parking slots in advance. As a result it can save time as well as the fuel which a driver burns while searching for the space to park the car. It will also overcome many problems which are created due to the lack of management of the traffic. The main advantage is space optimization, cost-effectiveness, and security.

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