



“Smart Park” Android Application

Miss.Ashvini Wakodkar¹; Miss.Komal Chandekar²& Asst.Prof.Rushikesh Shete

Department of Computer
Science & Engineering
RTMNU University

wakodkarashvini@gmail.com

Department of Computer
Science & Engineering
RTMNU University

komalchandekar@gmail.com

Department of Computer
Science & Engineering
RTMNU University

Sheterushikesh7@gmail.com

ABSTRACT:

The number of personal vehicles usage is increasing manifold. People prefer personal vehicles to commute than depend on public transportation. Finding a parking space in most metropolitan areas, especially during the rush hours, is difficult for drivers. Parking problems are becoming ubiquitous and ever growing at an alarming rate in every major city. Due to this there is a need to provide sufficient parking places coupled with plenty of slots to help the user park his vehicle safely, also to ensure the user does not end up parking on non-parking area and cause discomfort to pedestrian.

The idea behind our Android Application-“Smart Park” is to help the user analyze area’s where parking is available and number of slots free in that area. The user can pre-book a slot in the area he desires if it is available. This will help reduce the load on the administrator as his physical work reduces drastically and user can search the parking slot through Android Application. Payment services are made available using Google Wallet, so the user is required to own a credit card or debit card. “Smart Park” Application relieves the user from the hassle of manually searching and waiting for empty slots to park the vehicle. “Smart Park” application is based on the client-server architecture. The client is provided with an interactive Android based user interface for the process of pre-booking of parking slot. The client requests the server for locations where parking is available and the server responds with slots availability.

Index Terms- Pre-booking of slots; android based application; client-server application.

1. INTRODUCTION

With the rapid proliferation of vehicle availability and usage in recent years, finding a vacant car parking space is becoming more and more difficult, resulting in a number of practical conflicts. Parking problems are becoming ubiquitous and ever growing at an alarming rate in every major city. Wide usage of android technology with the recent advances in wireless applications for parking, manifests that digital data dissemination could be the key to solve. This project proposes a “Smart Park Android Application” based on android technology for avoiding the parking problems which provides process of pre-booking the slots through the use of a simple and

interactive android application. This application is expected to provide an efficient and cost-effective solution to the effluent vehicle parking problems. The user needs to have an android enabled device to reap the benefits of this application. After installing the “Smart Park” app, user needs to mandatorily register with the application. Booking of the slot at user’s desired location should be done before the arrival. Payment services are made available using Google Wallet in the future. During reservation process the client needs to provide with details that includes booking person’s name, vehicle number, expected entry and exit time.

Papers presented in ICRRTET Conference can be accessed from

<http://edupediapublications.org/journals/index.php/IJR/issue/archive>



Android is an operating system, developed for mobile devices like Smartphone's and tablet computer. It is the Smartphone platform. Within the last couple of years an expensive process has begun to emerge integrating computational logic into various kinds of objects of our everyday life and allowing us to persistently interact with those objects. "Smart Park" application is based on the client-server architecture. The client is provided with an interactive android based user interface for the process of pre-booking of parking slot. The client requests the server for locations where parking is available and the server responds with slots availability.

2. LITERATURE SURVEY

With the increase of economic behavior and the upgrade of living standard, the ratio of people in India who own automobiles and motorcycles have recently increased giving a boost to Metropolitan Traffic. Therefore, parking issues will be a big challenge to facilitate traffic network and ensure urban life quality. Searching for parking space in most metropolitan areas, especially during the rush hours, is difficult for drivers. The difficulty arises from not knowing where the available spaces may be at that time; even if known, many vehicles may pursue very limited parking spaces to cause serious traffic congestion [1]. As the existing system discussed above uses different techniques to control traffic problems faced in day to day life also it requires sensors to avoid parking problem.

WSN technology has attracted increased attention and is rapidly emerging due to their enormous application potential in diverse fields [3]. Smart Parking has the potential to save people time, reduce traffic congestion, allow better management of parking supply, provide benefits to businesses.

Reservation based parking system requires CCTVs and physical presence of administrator to control allocation of free slots. This system requires rooms having a costly affair of CCTVs and their management which takes around 4 Lakhs.

VANET based system mostly requires wireless devices for communication. It also requires sensor technology.

3. CHALLENGES

The existing parking systems have lots of problem. The main problems face by the systems concluded as follows:

1. Searching for a vacant parking space in a metropolitan area is the daily concern for most drivers, and it is time consuming. It commonly results more traffic congestion and air pollution by constantly cruising in certain area only for an available parking space.
2. To detect the status of an individual parking space different methods have been utilized such as ultrasonic sensors placed at each space (thus it requires many sensors), or surveillance cameras placed at a high position.
3. The cost of using the techniques such as wireless sensors, CCTV cameras is far expensive to afford for small organizations.

4. OVERVIEW

4.1 Wireless Sensor Network Parking (WSN)

To avoid parking problem, widespread use of wireless technologies paired with the recent advances in wireless application for parking, manifest that digital data dissemination could be the key to solve emerging parking system. WSN technology has attracted increased attention and is rapidly emerging due to their enormous application potential in diverse fields [3].



The WSN system proposed by I. Akyildiz, W. Su, Y. Sankara Subramaniam, E. Cayirci, J. P. Lynch, K. Loh. Shock , Infrared (IR) sensor nodes senses the status of the car space and transfers the information to a controller. It thereby displays the information on a LED screen with which the user can check for empty vehicle slots, in turn reducing his time. As infrared cannot penetrate walls, therefore it cannot be used in closed parking areas due to low wavelength (E.g. shopping malls or residential area where parking is done in enclosed area)[5].

4.2 Reservation based smart parking system

To avoid parking problems this system uses CCTV cameras. This system requires rooms having a costly affair of CCTV's. The difficulty arises from not knowing where the available spaces may be at that time even if known, many vehicles may pursue very limited parking spaces to cause serious traffic congestion. In this existing system that is "Reservation-based Smart Parking System (RSPS)" that allows drivers to effectively find and reserve the vacant parking spaces. By periodically learning the parking status from the sensor networks deployed in parking lots, the reservation service is affected by the change of physical parking status. The drivers are allowed to access this cyber-physical system with their personal communication device.

4.3 VANET- Based Smart Parking

Finding a vacant parking space in a congested area or a large parking lot, especially, in peak hours, is always time- consuming and frustrating to drivers. It is common for drivers to keep circling a parking lot and look for a vacant parking space [6].

VANET stands for vehicular ad-hoc network are proposed by "Rongxing Lu, Xiaodong Lin,

Haojin Zhu, and Xuemin (Sherman) Shen". Searching for a vacant parking space in a congested area or a large parking lot and preventing auto theft are major concerns to our daily lives. In this parking scheme for large parking is control through vehicular communication. The proposed scheme can provide the drivers with real-time parking navigation service, intelligent anti-theft protection, and friendly parking information dissemination [6].

5. OBJECTIVES

1. "Reducing traffic congestion" - By guiding people to a parking space more quickly, Smart Parking would reduce traffic congestion. (The city of Nice has concluded that Smart Parking has reduced congestion by 10 %).
2. By providing real time information on occupancy, Smart Parking technology will highlight areas of high parking demand and "improve the Government's ability to manage parking" supply.
3. By making it easier to find a parking space, Smart Parking would make it easier for businesses to "attract customers". It can be implementing not only for big organizations such as stadiums but also at school, library, hospitals, parks etc.
4. Completing the reservation without communicating with the central system. Therefore, the central system has no longer needs to maintain the reservation service.
5. By providing real time images using GPS, user will get a rough idea about the parking place.

Future Scope

1. The Application can be developed for other popular mobile operating systems. In future, this application can be implemented

Papers presented in ICRRTET Conference can be accessed from

<http://edupediapublications.org/journals/index.php/IJR/issue/archive>



on the existing operating systems like Windows and BlackBerry.

2. Our application can be used as an alternative to the present parking systems in malls, at railway stations, near airports, theatres, etc. as an efficient means to park. Google Wallet can be used to make secure payments fast and convenient.
3. We can embed the Google maps into application to provide the real time view of the parking space.

6. MODULES

Module 1: Creating an Account:

The user module will enable the user's to create the accounts as an owner or as an user to park their vehicle. The user creating account as an owner have to submit certain information about the parking place, whereas the person creating account as a user have to fill certain information with respect to their timings, personal details and about their vehicle.

Module 2: Details About Owner:

In this module the owner have to fill certain information regarding his parking area. This information may contain name of place, place's address, parking facilities slot details. This information will be accessible to the user who is going to park their vehicle.

Module 3: Details About User :

In this module the user have to fill certain information personal details and about the vehicle. This information may contain name of user, contact number, vehicle type (2w/4w), vehicle number, arrival time and departure time. This information will be accessible to the owner and will be maintain with security and integrity.

Module 4 : Place To Park :

In this module the user have to select the city in which he wants to park his vehicle. After selection of the city, the places having this parking system will be visible to the user. Afterwards he will be able to select certain place to park his vehicle.

Module 5: About Selected Place :

This module will be visible to the user after selecting a place to park his vehicle. A diagrammatical representation is given in fig. a, in which the slots marking with the stars are booked slots whether the slots not marked, are available for parking. The slot will be recommended to the user with the help of best fit algorithm and RAG protocol.

Module 6: Booking Details :

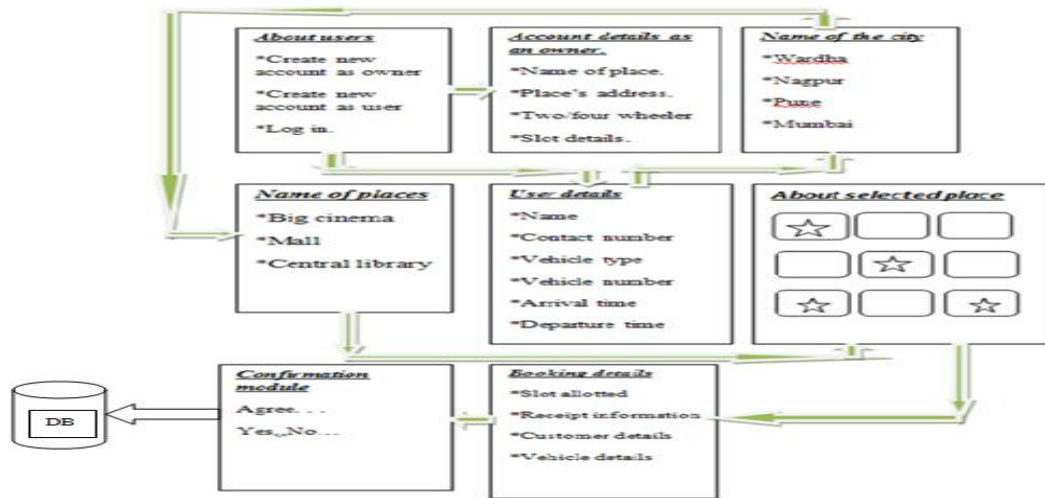
This module will provides the booking details such as which slot is allocated, information regarding the payment, customer and vehicle details.

Module 7: Confirmation Module:

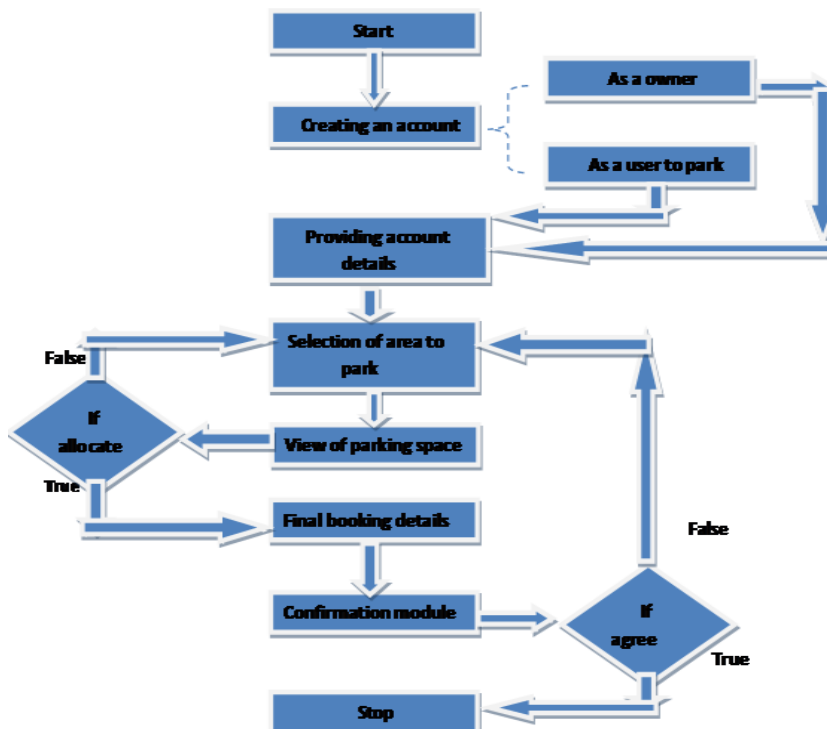
This module will ask the user about the assurance regarding the booking, if he agrees then slot gets booked otherwise not.



7. ARCHITECTURE



8. FLOW GRAPH





9. CONCLUSION:

The main goal of application will be to analyze the problem related to the vehicular parking. It will be mainly used to provide the smart parking system. This work will describe performance evaluation of the best fit allocation algorithm and the RAG technique for the system prospective in this application, which will help to reduce the traffic congestion by guiding the people for the parking space more quickly. This application can be used as an alternative to the present parking systems in malls, at railway. GPS (Global Position System) helps the user to find the co-ordinate and right path of the parking spot. This application can be used as an alternative to the present parking systems in malls, at railway. GPS (Global Position System) helps the user to find the co-ordinate and right path of the parking spot. By providing real time information on occupancy, Smart Parking technology will highlight areas of high parking demand and improve the Government's ability to manage parking supply.

10. REFERENCE

[1] Mohit Patil, Rahul Sakore, "Smart Parking System Based On Reservation" , ISSN (Online): 2347-3878 Volume 2 Issue 6, June 2014.

[2] Lalitha Iyer, Manali Tare, Renu Yadav, Hetal Amrutia, "Android application for vehicle parking system", ISSN 2347 – 8616 Volume 3, Issue 3 May 2014.

[3] I. Akyildiz, W. Su, Y.Sankara Subramaniam, E.Cayirci, "A survey on sensor networks"IEEE Communication Magazine, 40(8): 102-114, 2002.

[4] Hongwei Wang, Wenbo Hey. "A Reservation-based Smart Parking System"

[5] J. P. Lynch, K. Loh. Shock and Vibration Digest,"A Summary Review of Wireless Sensors and Sensor Networks for Structural Health Monitoring", Sage Publications,38(2):91-128, 2005.

[6] Rongxing Lu, Xiaodong Lin, Haojin Zhu, and Xuemin (Sherman) Shen, "A New VANET-based Smart Parking Scheme for Large Parking Lots" Department of Electrical and Computer Engineering, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1 Faculty of Business and Information Technology, University of Ontario Institute of Technology, Oshawa, Ontario, Canada L1H 7K4.

[7] "Operating System Concept" by Abraham Silberschartz, Peter Bear Galvin, Greg Gagne.

[8] "Introduction to Algorithm" by Thomas H. Cormen, Charles E. Leiserson, Renald L. Rivest, and Clifford Stein.

[9] "Reservation Based Vehicle Parking System Using GSM and RFID Technology" by K.Sushma, P. Raveendra Babu, J. Nageshwara Reddy.