iParking: An Intelligent Android-Cloud Based Smart Parking Reservation System Using Smart Phones Supportive to Smart City

Ankita Khadsare, Savitribai Phule Pune University, Department of Computer Engineering, Maharashtra, India
Gauri Jadhav, Savitribai Phule Pune University, Department of Computer Engineering, Maharashtra, India
Sayali Mali, Savitribai Phule Pune University, Department of Computer Engineering, Maharashtra, India
Shivani Nanaware, Savitribai Phule Pune University, Department of Computer Engineering, Maharashtra, India

ABSTRACT

Finding a parking in most of the metropolitan areas, especially during the rush hours, is difficult for drivers nowadays. The iParking system proposed in this paper allows drivers to find and reserve the vacant parking slots through their smartphones and additionally support the principles of “Smart City.” The design and implementation of this proposed system called Reservation Based Smart Parking System (RSPS) is based on cloud computing and android application and finds availability of nearest parking slots. The objective is to reduce the time in finding the parking lots and avoid unnecessary traveling. The technology proposed in this paper is Infrared Sensors (IR Sensors) used for detecting the occupancy of parking slots. The iParking uses Radio Frequency Identification Devices (RFID) to identify and track a car. The methodology proposed in this paper can easily be compared with existing parking system in terms of reducing the fuel consumption.

KEYWORDS

Android Application, iParking, IR Sensors, Radio Frequency Identification Device (RFID), Reservation Based Smart Parking System (RSPS)

INTRODUCTION

The Problem definition is - To design an intelligent android-cloud based smart parking reservation system to reserve/book places for parking in a specific areas through the android application which will help to resolve the parking issues in Metropolitan areas.

Advancements in computer and communication technology and the birth of mobile phone not only gives ease in our day-to-day life but also gifted us with a variety of multimedia applications to visualize complicated graphical user interface on cell-phones. Pre-booking of parking using RSPS is an excellent example of such applications.

Following are some of the benefits of iParking:

- Pre-booking of parking allows a user to book the desired parking slot of the specific parking area.
- Payment of parking slot can be done through the application rather than paying and getting bills at parking area.

DOI: 10.4018/IJSE.2017070101

Copyright © 2017, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.
• The admin handles the entire management of a parking areas and user’s information single handedly.
• There is absolutely no need of security and management of parking provided the user follows all the instruction through iParking system.
• Easy supervision on the entire system is possible through sensors and real-time analysis which give information of occupied and unoccupied parking places.

LITERATURE SURVEY

See Table 1.

PROJECT SCOPE

Presenting the design and implementation of a Reservation Based Smart Parking System based on cloud computing and android application. This Android application allows drivers to book their desired parking slot from Android application which additionally supports the principles of “Smart City”. It is mainly focusing on reducing the time in finding the parking slots by avoiding the unnecessary traveling in the parking area.

Aim

Driver can choose the convenient parking slot of respective parking areas of a particular city through the android application. This indeed helps them find safe and secure parking slots for their vehicles. After verification process, admin will allot the same parking slot reserved by the driver.

Objective

The main objective of this project states that the User should be successfully authorized by admin side to communicate and use the Android Application to book the desired parking slot. It can be done by user with the help of proper GUI of parking areas and their vacant slots which will be available on android application to book the parking.

This information related to the booking will be sent to Admin through server so that Admin can easily verify each user, when user will reach at the parking place to be recognized using RFID tags and reader. User can get the updated data on Android application as admin will keep updating the data of parking slots collected from sensors on android application.

SYSTEM DESIGN

The System design shown below mainly focuses on the server where the entire record of the system is placed. Also, its operations have been kept and accessed from the respective sources like database, admin, android application and hardware units. Database block represents the storage of information from Admin, whereas Android application can have utilities of performing operations. This system has multiple activities which are getting performed at the same time considering every component of system design. Refer to Figure 1.

SYSTEM ARCHITECTURE

The system architecture proposed in this paper consists of three main modules, android application, admin and hardware unit. The Figure 2 illustrates each of these modules.