Impact Factor (SJIF): 5.302

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 5, Issue 5, May-2018

IoT BASED SMART CAR PARKING SYSTEM.

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ABSTRACT

In recent times the concepts of smart cities have gained grate popularity. Thanks to the evolution of Internet of things the idea of smart city now seems to be achievable. Consistent efforts are being made in the field Of IoT in order to maximize the productivity and reliability of urban infrastructure. Problems such as, traffic congestion, limited car parking facilities and road safety are being addressed by IoT. In this paper, we present an IoT based cloud integrated smart parking system. The proposed Smart Parking system consists of an on-site deployment of an IoT module that is used to monitor and
Signalize the state of availability of each single parking space. A mobile application is also provided that allows an end user to check the availability of parking space and book a parking slot accordingly. The paper also described as high-level view of the system architecture. Towards the end, the paper discusses the working of the system in form of a use case that proves the correctness of the proposed model.

KEYWORDS

IoT, HOSTINGER SERVER,

INTRODUCTION

LITERATURE SURVEY

Paper name:``DisAssist: An Internet of Things and mobile communications platform for disabled parking space management''Authorname:L. Lambrinos and L. DosisIn *Proc. IEEE Global Commun. Conf. (GLOBECOM)*, Dec.2013, pp. 2810_2815.

Review:We have thousands of car parks located everywhere, including large, medium and small sized car park. Most car parks provides a wide range of services and charging models to fulfill customers‟ needs, the most common services are monthly, daily and hourly parking reservation service, where monthly and long term parking service are provided via prior registration, daily and hourly services are provide in a drop-in/walk-in and first come first serve (FCFS) manner. Currently, there are some car web-based park searching system existed, however, there is no online car park reservation system existed in Hong Kong.

Paper name:``Smart routing: A novel application of collaborative path Ending to smart parking systems,'' in *Proc. IEEE 16th Conf. Bus. Infom.*, Jul. 2014, pp. 119_126. Author name: C. Rhodes, W. Blewitt, C. Sharp, G. Ushaw, and G. Morgan

Review:There are existing smart parking systems and many still undergoing developments. These software's make use of Internet of Things (IoT), Radio Frequency Identification (RFID), Wireless sensor networks (WSN), Zigbee technology to sense the presence of a car and in parking meters at the payment gateway. Various cameras and sensors are used to monitor the parking lot. There are other models which include multi-storied parking, booking of parking using Short Message Service. People are working on increasing the efficiency of cloud-based smart-parking systems. In addition, there are Parking Management Servers with IoT hardware platform and Mobile App. Further a lot of these software's use various shortest path algorithms and synchronize it with the GPS (Global Positioning System) and maps for better user interface. We have proposed a secured version of this parking system which has the best features of all the existing work for better usability and user experience. The existing systems are lacking security and may be high on cost and maintenance however, our proposed model is an integration of security with the other features in order to cater the needs of emerging economies where the traffic problem is severe and the budget is low with frequent security issues.

Paper name:``Cooperation versus competition towards an efficient parking assignment solution,'' in *Proc. IEEE Int. Conf. Commun.*, Sydney, NSW, Australia, Jun. 2014, pp. 2915_2920. Author name:N. Mejri, M. Ayari, R. Langar, F. Kamoun, G. Pujolle, and L. Saidane.

Review:Parking guidance system is systems that obtains information about available parking spaces, process it and then present it to drivers by means of variables message signs. This system can be implemented in two ways, which are to guide drivers in congested areas to the nearest parking facility with empty parking lots. The latter guidance system addresses driver's need for information about the position and number of the parking lots that are actually available within a parking structure. This system reduces time and fuel while searching for empty parking lots and helps the car park to operate efficiently.

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Review:In today's world parking lots have become redundant and needs lot of manpower to handle and maintain it. These parking lots are not user friendly and do not provide data regarding availability of free spaces. Many researchers have contributed to this issue and formalized with various methods to better optimize the parking lot to serve the needs. The author proposed smart parking reservation system using short message services (SMS), for that he uses Global System for Mobile(GSM) with microcontroller to enhances security. The ZigBee technique is used along with the GSM module for parking management and reservation. The author uses Global Positioning System(GPS) and Android platform to show available parking spaces. However, reservation for the same is not available .

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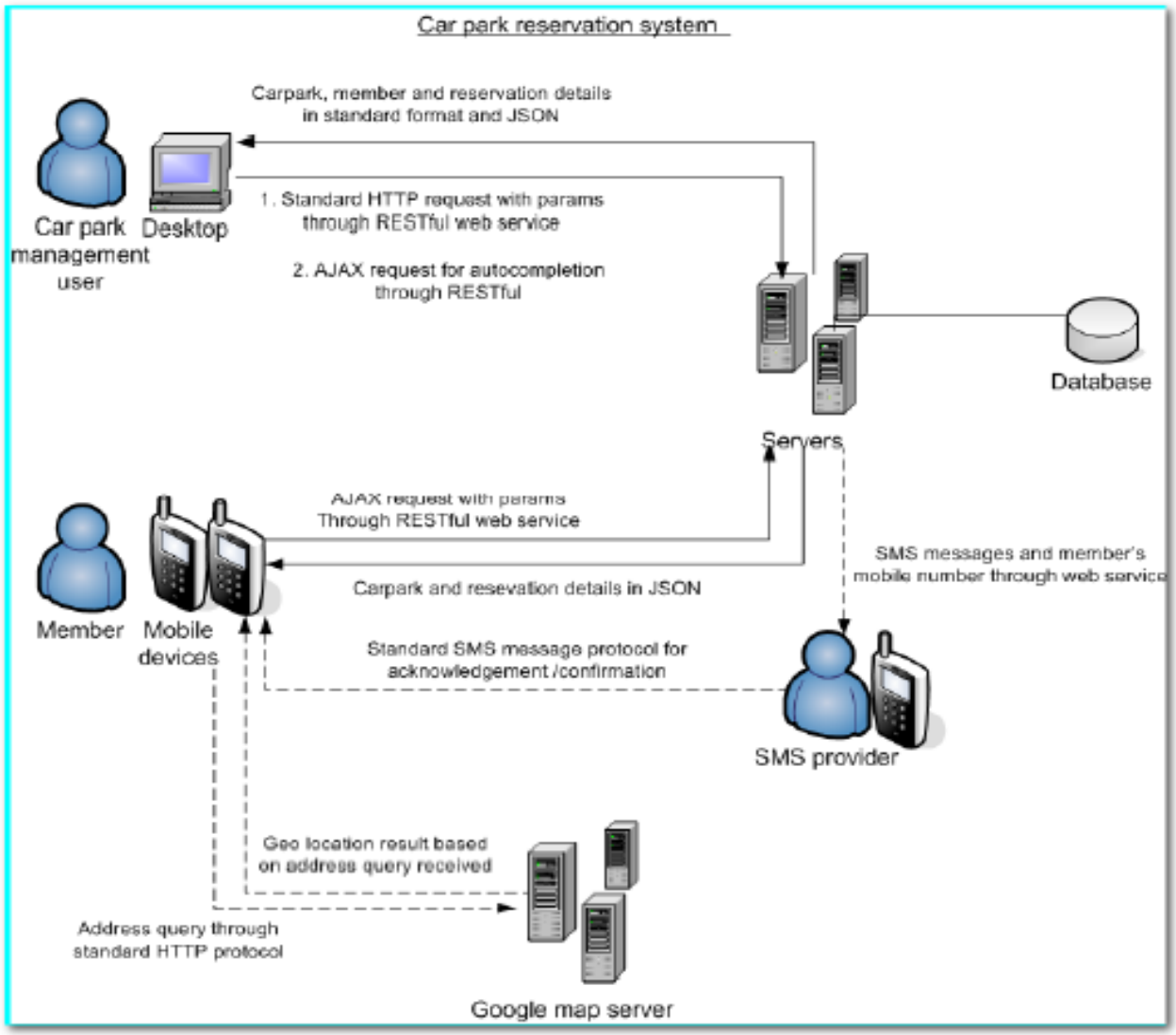
Various methods are prevalent for development of autonomous or intelligent parking systems. Study of these systems shows that these require a little or more human intervention for the functioning. One of the intelligent systems for car parking has been proposed by making use of Image processing. In this system, a brown rounded image on the parking lot is captured and processed to detect the free parking slot. The information about the currently available parking slots is displayed on the 7-segment display. Initially, the image of parking slots with brown-rounded image is taken. The image is segmented to create binary images. The noise is removed from this image and the object boundaries are traced. The image detection module determines which objects are round, by estimating each object's area and perimeter.

SYSTEM MODEL

In this section we formalize system and algorithms.

SYSTEM ARCHITECTURE:



MQTT ALGORITHM

- **Step 1: Install and login to the smart parking application on your mobile device.**
- **Step 2: With the help of the mobile app search for a parking area on and around your destination.**
- **Step 3: Select a particular parking area.**
- **Step 4: Browse through the various parking slots available in that parking area.**
- **Step 5: Select a particular parking slot.**
- **Step 6: Select the amount of time (in hours) for which you would like to park your car for.**
- **Step 7: Enter the OTP.**
- **Step 8: Pay the parking charges either with your ewallet or your credit card.**
- **Step 9: Once you have successfully parked your car in the selected parking slot, confirm your occupancy using the mobile application.**

CONCLUSION

As per conclusion,the objective of online booking system have been achieved.The difficulty of searching available parking slots has been partially eliminated via this system.Users can learn about parking areas for particular locations.It saves user's time for searching of parking spaces.

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