

Research paper on Smart City Parking System

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ABSTRACT

Parking in the city has been a major problem these days. An efficient way to manage the parking system is using Internet Of Things (IOT). Traditional parking system commonly uses security ultrasonic sensors, camera or infrared ray sensors to manage the parking areas. However, these systems are not only expensive but time consuming. So it is necessary to have a smart parking system. So in this system we are using RFID tag to each of the car and also assigning a sensor to each parking slot. Using an android application user may able to see the available parking slot so that it will require less time than previous system. Also we will provide information to the user about nearest places that is hospitals, hotels, school etc. So to implement this idea we are using sensors and RFID.— Smart city parking, sensors, RFID, Internet Of Things (IOT)

Keyword: - Smart city parking, sensors, RFID, Internet Of Things (IOT)

1. Introduction

Parking is limited in almost every big city in the world— leading to air pollution, traffic congestion, and driver frustration. For example, the Amanora Mall Magarpatta Central IT Industry District Pune(AMD).Yet, often parking spots are wasted. In large parking areas, a driver may exit the area without knowing about new spots that have just become vacant. Finding an empty parking slot may also lead to driver frustration if before the driver can reach it another car takes the spot. Thus, innovative parking systems for meeting near term parking demand are needed. With computer controled wireless communications, , and electronics technologies, intelligent service-oriented parking management car improve driver experience and parking space utilization and improve while decreasing drivers' frustration. Our motivation is to fill the near termparking demand using the Internet of Things(IOT). The contributions of our system include: 1)Reduce time 2) increasing space utilization,3) improving drivers' experience, and 4) providing intelligent management. 5)Saving Fuel From the point of users' view, Smart City Parking system which is an intelligent and secure parking service. Parking information and vehicle information are collected and transmitted by the wireless network using sensor detection. The proposed infrastructure prevents most security or privacy attacks. The parking navigation is efficient and convenient. Drivers can view and reserve a parking spot from anywhere. The parking process can be a non-stop and straightforward process. From the point of management's view, Smart Parking The proposed system consists of IR sensor, RFID tag and e-valet, server. In this system we are providing an android application to the user. This application will give a graphical view of the available parking slots. IR sensors will do a main role in this care. Since when any car is parked at any position IR sensor will sense that and according to that the changes will be done in graphical view of the application. So IR sensors must have to sense continuously to the parking slot. The user most of the time visit that place can register to take advantages of e-valet facility.

2 Related Work

A. Collecting Occupancy Information Sensor Flap Parking System is a parking facility in which an occupancy sensor is installed in each parking space.

A flap plate for settling a car is raised when a car is parked in the slot. This method has an advantage to exactly sense a parked car, while deployment and maintenance cost tends to be high.

B. Parking Route Navigation Chinrungrueng et al. proposed a method based on wireless sensor networks. The system collects parking status information in real-time using wireless sensor networks, and informs all drivers of a different parking space. However, the deployment cost of wireless sensors is not low. With the same objective, Tang et al. proposed a method using low cost sensors which provides a parking navigation service. Unfortunately, maintaining this system is troublesome, and this disadvantage cancels out the benefits of the low deployment cost. Lu et al. proposed a smart parking scheme for large parking facility (SPARK) that utilizes vehicular communication technology. With this method, by using sensors a central server collects the parking space status information, and locates the position of cars using infrastructure-to-vehicle (I2V) communications. Based on the obtained information, the server gives each car with an electronic ticket that assigns a specific parking slot to the car. Cars are not allowed to park at slots that are not specified by the tickets. However, there are two problems: (1) In a crowded parking facility, it is difficult to get to the specified parking space, and (2) If drivers do not park at the specified parking space, the system will fail (which we call the *Selfish Driver Problem*).

C. Finding the position of Vehicle because inside buildings GPS cannot be used, we need an alternative positioning method in order to locate vehicle position in a multilevel parking facility. Recently many indoor localization methods have been proposed. Some of these are range-based positioning methods based on (RSSI) Received Signal Strength Indication using 3G Cellular, WiFi, etc. Common to these methods is they are based on trilateration and the system estimates the distance between the target object and at least three anchors, according to the RSSIs sent from anchors. By using the distance information and the anchors' positions the system estimates the position of the target object. The typical estimation error is about 5-10 meters.

3 PROPOSED METHOD

Traditional parking system commonly uses ultrasonic sensors, security camera, or infrared ray sensors to manage the parking areas. However, these systems are not only expensive but time consuming.

We will compare our system with previous methods listed below:

Random Parking: Cars randomly select a target slot. If the car cannot park because the target slot is full, then the car will select the next target randomly.

Billboard Advertising Parking: Cars select the most popular vacant zone shown on the billboard as a target slot. If the car cannot park because the target slot is full, then the car selects the next target area randomly.

Greedy Parking: Popular zone is selected by 50% of cars as a target. Even if the target slot is full, the driver does not give up immediately. The driver selects the 2nd best popular zone as the next target, if a vacant space cannot be found after searching 5 zones.

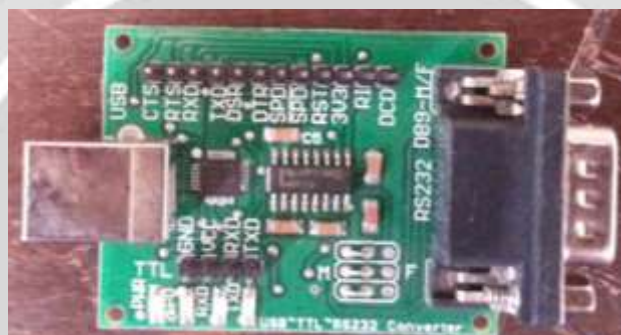
So it is necessary to have a smart parking system. There are two types of car parking systems: Automated and traditional. In the long term, automated car parking systems are more cost effective when compared to traditional parking garages. IOT is a best option for smart parking system. In this system we are providing an android application to the user. This application will give a graphical view of the available parking slots. IR sensors will do a main role in this care. Since when any car is parked at any position IR sensor will sense that and according to that the changes will be done in graphical view of the application. So IR sensors must have to sense continuously to the parking slot. The user most of the time visit that place can register to take advantages of e-valet facility. For that we will provide RFID tag to user. When a registered user enters the parking place the RFID tag will be sensed and the admin will check whether the user is authorized person or not. Entering time is also saved when the RFID tag is sensed at the arrival of the car. And when car leaves the parking area that time is also get calculated according to that charges will be deducted from user's e-valet. For the random user did not registered can see the available parking slots. Also we will provide information to the user about nearest places such as hospitals, hotels, school etc.

4 Figures

RFID Reader



Rs232 connector



Future Enhancement

We can add online wallets like paytm freecharge etc for payment method.

5 CONCLUSION

We have successfully completed our work on smart city parking system. Now this system is ready to be used in any parking area in Smart Cities.

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