

Smart Parking System Using IOT

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Abstract: The numbers of vehicles are increased in last decades so the problem of parking is also increased as the number of vehicle increased. There are very few solutions for managing parking areas but most of them are not sufficient and fail or most of them require a person to manage the space, our approach automates the process without requiring another person. When any car enters in particular parking area, the sensors are placed at parking slots. As its name indicates, ultrasonic sensors measure distance by using ultrasonic waves. An, whereas an ultrasonic sensor uses a single ultrasonic element for both transmission and reception. When ultrasonic sensor transmit signal if it bounced back it means that that parking slot is not empty thus it will inform the particular person via android application and if it not bounced back to receiver then it means parking slot is empty for car parking. for such smart parking system, we developed an android application of smart parking system. This android application will show which parking slots are empty and which are not empty. IOT can transmit and receive information over the network for controlling the things with or without human help. Here information is caught by sensors are transmitted through web. Android application will navigate the user to reach those available parking slots in particular area. For navigation for user we use Google maps API for displaying maps.

Keywords: component, formatting, style, styling, insert

I. INTRODUCTION

Transportation is one of the major problems in metropolitan areas around the world. As expose by the Transport Department, the total number of vehicle's registration keep raising year on year since 2006, with a latest number of 682,777 total registrations which includes 465,453 registrations for private cars were cataloged on September 2011. On average, it is a very high people per vehicle ratio considering with such a high ratio, it puts a high pressures and requirements on facilities supporting driver's daily needs; it brings in a challenging situation for company to hand over a good quality of service to their customers. Although there are many different kinds of offer provided by car park company to smoothen and comfort this situation, for instance, different kinds of payment method, park and ride scheme, various award and reward schemes as well as free parking scheme, it is still not a very suitable experience and hard to fulfill driver's immediate parking needs. The traditional parking systems such as multiple or multi-store car parking systems (non-automated), robot car parking systems, automated multilevel car parking systems etc. have been implemented on a huge scale. But these systems have a major drawback of large space consumption which is successfully eliminated with the use of our system which provides real time information about the parking spot available in the area

II. PURPOSE

- To develop user friendly car parking system this reduces the manpower and traffic congestion.
- To offer safe and secure parking slots within limited area.
- To make remote spot check easier.
- To reduce manpower
- To avoid traffic congestion

III. CONSTRAINTS

There are very few constraints in the system. The first one is the raspberry pi. There are limited IO ports that are available on the board of raspberry pi. So if in a particular area if the parking slots are more then we will need to use multiple raspberry pi and the network connection can be more complex as the number of raspberry pi increases. This problem can be solved by nesting the connection of the raspberry pi with each other in a particular topology. Another constraint is about the network connection. The network connection should be strong enough and widespread to cover almost all the raspberry pi. This can be done by tweaking the bandwidth or by giving wired connection to the raspberry pi. The last constraint is about the sensor that we are using. The sensor should be taken care of if hit by something or damaged it will provide false information which may lead in some great problems

IV. OVERALL SYSTEM DESCRIPTION

A. Existing System

Various methods are common for development of autonomous or intelligent parking systems. Study of these systems shows that these require a little or more human interference for the functioning. One of the intelligent systems for car parking has been scheduled by making use of Image processing. In this system, a brown rounded image on the parking slot 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 eliminated from this image and the object boundaries are traced. The image detection module determines which objects are round, by estimating each object's area as well as perimeter. Accordingly, the free parking space is allocated. A vision based car parking system is developed which uses two types of images (positive and

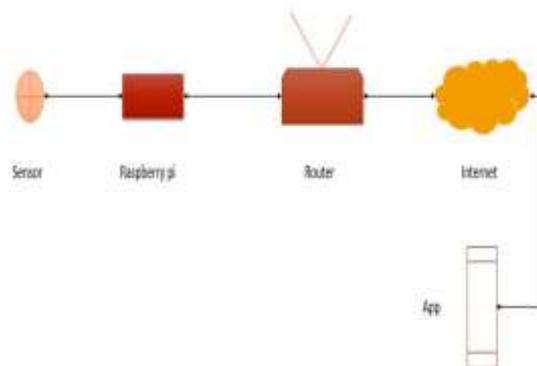
negative) to expose free parking slot. In this method, the object classifier identifies the required object within the input. Positive images consist of the images of cars from various angles. Negative images do not consist of any cars in them. The coordinates of parking lots specified are used as input to detect the existence of cars in the region. Haar-like features are used for feature detection. However, limitations may occur with this system corresponding to the type of camera used. Also, the coordinate system used selects specific parking locations and thus camera has to be at a fixed location. Limited set of positive and negative images may introduce limitations on the system.

B. Implemented system

The Smart Parking System contains Automated Parking. It is simple parking system which helps to car driver to find the parking slots remotely. A user enters in smart parking application it shows the current location of the user and available parking area. A user selects particular parking slot then application provides navigation towards the selected parking slot through Google maps API. When car is parked, the ultrasonic sensor provides a signal to a server through Raspberry pi for availability of parking slots and this updated structure display on application

C. System Architecture

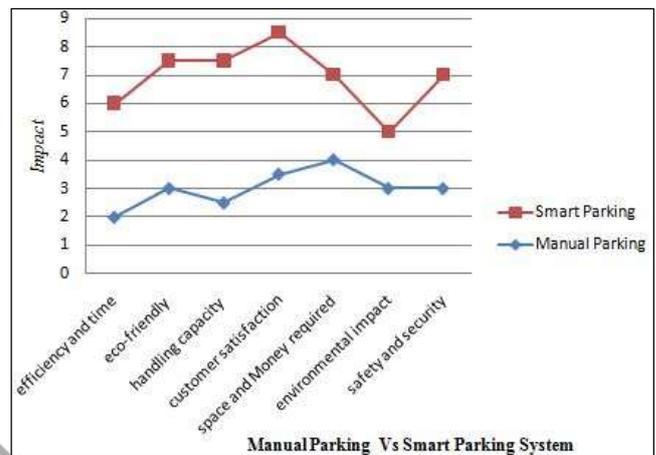
1. In this system we use ultra-sonic sensor which is used to detect and sending signal to raspberry pi up to 3m to 3cm.
2. When a car enters in parking area then sensor detect the signal and transmit to a raspberry pi.
3. Sequentially, first we get the status of the sensor using the python code on raspberry pi the sensor information is usually in binary 0 or 1 or sometimes as high and low depending on the sensor that we use.
4. Raspberry pi is the powerhouse of the whole system as it checks the sensor data and sends data back and forth from the sensor to the server.
5. Server act in between the raspberry pi sensor and the mobile app. Here the main data is stored and then processed to get results which is shows on end user mobile application.



RESULT

After the testing and completion of project smart parking using IOT, we generate system which provide automation in parking. The previous parking system is work or based on manually monitored or cctv, Which is not automated as compare to previous system. This system provide us automation in parking system, the system shows nearby area which tie up with smart parking system along with its navigation. Mobile application is also provided that allows end user to check the availability of

parking space to end user which update in after 30sec. This system reduce human work efficiently. This is one of the major advantage over previous manual parking system.



CONCLUSION

The development of Internet of Things offers ascend to a few new potential outcomes in fields of smart cities and smart transportation. This system addresses the issues of parking and difficulties in finding better routes in public transportation systems and proposes an idea of IOT based smart parking system along with an intelligent signboard. The parking system gives constant information about accessibility of parking slots and smart signboard which utilizes the advantages of Internet of Things to display useful information about the place such as different paths to a place, the less congested way. The endeavors made in this system are planned to enhance the parking facilities of the city and upgrade the personal satisfaction of individuals. This system is very secure for parking; members do not need to worry about their vehicles and they can focus on their work.

This proposed system will be helpful to solve the parking problem. The components use in Smart Parking system used are lower in price which will make the system cost effective, so the maintenance of the system will be lower in cost and it is easy to repair. Smart Parking System provides more security as raspberry pi runs on Linux distribution.

REFERENCES

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