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Smart Parking System and Number Plate Recognition Using Cloud and IOT

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ABSTRACT: This paper presents the generic concept of using cloud-based intelligent car parking services in smart cities as an important application of the Internet of Things (IoT) paradigm. This system includes an algorithm that increases the efficiency of the current cloud-based smartparking system and develops a network architecture based on the Internet-of-Things technology.This system helps users to automatically and afree parking space at the low cost based on the performance to calculate the parkingcost by considering the distance and the total number of free places in each carpark. This cost will be used to and the available parking space on a request bythe user and a solution of suggesting a new car park if the current car park is full.The results show that the algorithm helps to improve the probability of successful parking and minimizes the user waiting time. Automatic number plate recognition method uses optical character recognition on images to read the number plates on vehicles. They can use existing closed circuit television, or cameras designed for the task. They are used by various police forces and as a method of electronic toll collection on pay-per use roads and parking.

KEYWORDS: Internet of Things (IoT), Smart Parking System,ultra-sonic Sensor .

I.INTRODUCTION

The smart parking system is designed in such a way that it is applicable for covered parks and street side parking. To show the cloud based IOT architecture for smart parking system which contains cloud service provider which provides cloud storage to store information about status of parking slots in a parking area. The centralized server which manages to store entire smart parking systems information such as number of slots, availability of vehicles etc. And this information will be accessed through some secured gateways through network .Quick development of the world today is accompanied by the movement of both things and people. Drivers who are looking for vacant parking space come at the top of the sparking factor. Previously, huge numbersof techniques have been used in hindering such problems includingwireless sensor network. It has proposed a Wireless Mobile-based Car Parking System using android application. The implementation of android application into the car parking system, enable the drivers to receive information regarding the availability of car parking spaces. If there is available,means there is an empty parking space, driver may park their vehicle and proceed to the shopping.

An Automatic car parkingMonitoring and management system with help of automatic number plate recognition cameras hardware and parking managementas well as android applicationon side of software. The scheme issued to effectively manage, monitor and protect the parking facilities, Android application is used to facilitate the driversin remembering their parking slot, however, No facilities for searchers of vacant parking space and the system is limited in short distance since it doesn't give any information to the incomingdrivers about the current situation of the parking lots.

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II. PROPOSED SYSTEM

The system is derived from the idea of IoT. The system uses ultra-sonic technology to monitor car parks. An ultra-sonic reader counts the percentage of free parking spaces in each car park. The use of ultra-sonic facilitates implementation of a large-scale system at low cost. The system provides a mechanism to prevent disputes in the car park and helps minimize wasted time in looking for a parking space. After logging into the system, the user can choose a suitable parking space. Information on the selected parking location will be confirmed to the user via notification. Then, the system updates the status of the parking space to "pending" during which time the system will not allow other users to reserve it. If after a certain period of pending time the system determines that no car is parked in that space, then it changes the status to "available." The system will update the status from the node (the status of car park spaces) when a new car joins in the system. Therefore, the status of the overall parking system is always updated in real time. The system will help plot the parking time for each parking space in real time and can support the business with hourly parking charges.

III. INTERNET OF THINGS (IOT)

The concept of Internet of Things (IoT) started with things with identity communication devices. The devices could be tracked, controlled or monitored using remote computers connected through Internet. The scalable and robust nature of Cloud computing is allowing developers to create and host their applications on it. Cloud acts as a perfect partner for IoT as it acts as a platform where all the sensor data can be stored and accessed from remote locations.In this process IoT becomes internet of everything where anything can be connected to any network, anywhere, any and anybody. IoT uses cloud sources for connecting any networks. For connecting the things to internet require internet protocol, it is used for internet connection and it is uses an addressing format for any data transfer on the internet. In IoT, we use IPv6 instead of IPv4 due to limited addressing capacity. IPv6 is used to address the things. One host can be connected to other host directly by using unique identity provided by IPv6. To control the parking issue, IoT plays major role by using this user gets parking availability on smart phones and get accessed. Every object uniquely identified and accessible with the help of IoT.Car number plates can be identified by automatic number plate recognition system and also we can do parking management and toll fee collection also.The Indian number plates far different from other country number plates and the available algorithms are also not giving accurate results.

IV.SMART PARKING SYSTEM

The detection of a car is done by using the ultrasonic sensor. We use two ultrasonic sensor for detection.

We have to take in mind that the system will not consider a moving body as a car, so one sensor will not be enough, we have to detect the existence of the car from different points and distances.

There are things we considered when using more than one ultrasonic sensor:

1) Collision and interference between the ultrasonic sensors.
The reading of the two sensors at this way will not affect each other.

2) Timing between multiple readings for the sensors.

Since we can't read the two sensor at the same time, we read them one after another. The time between the two readings is very small less than one second, so if there's a car detected by one sensor then it will be detected by the other one.

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Ultrasonic Sensors:

An Ultrasonic sensor is a device that can measure the distance to an object by using sound waves. It measures distance by sending out a sound wave at a specific frequency and listening for that sound wave to bounce back. By recording the elapsed time between the sound wave being generated and the sound wave bouncing back, it is possible to calculate the distance between the sonar sensor and the object. Since it is known that sound travels through air at about 344 m/s (1129 ft/s), you can take the time for the sound wave to return and multiply it by 344 meters (or 1129 feet) to find the total round-trip distance of the sound wave. Round-trip means that the sound wave traveled 2 times the distance to the object before it was detected by the sensor; it includes the 'trip' from the sonar sensor to the object AND the 'trip' from the object to the Ultrasonic sensor .

Sensor Network (WSN):

Ultrasonic transducers are divided into three broad categories: transmitters, receivers and transceivers. Transmitters convert electrical signals into ultrasound, receivers convert ultrasound into electrical signals, and transceivers can both transmit and receive ultrasound.

In a similar way to radar and sonar, ultrasonic transducers are used in systems which evaluate targets by interpreting the reflected signals. For example, by measuring the time between sending a signal and receiving an echo the distance of an object can be calculated. Passive ultrasonic sensors are basically microphones that detect ultrasonic noise that is present under certain conditions.

Ultrasonic probes and ultrasonic baths apply ultrasonic energy to agitate particles in a wide range of materials

V.RELATED WORK

The Smart Parking System is designed by making use of some IOT supportable hardware's such as raspberry pi, audition boards etc. Herewe focusing on less power and more performance device so raspberry pi is the suitable microcontroller for our implementation. And installer is loaded into the storage device of microcontroller. This installer which consists of various hardware supportable operating systems such as Mac, OS, tiny, openelec, raspbianos etc. where these operating systems whichbasically consumes less power.

VI. CONCLUSION

Our shrewd stopping framework venture is wanted to be coordinated with another product application to help drivers to locate the unfilled spot in parking area all the more effortlessly with less time. Likewise our venture execute the greater part of the functionalities required in a parking area. for instance, execute a programmed path for installment.

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