DETECTION AND IDENTIFICATION OF VEHICLE'S NO PARKING AREA USING IOT AND CLOUD – A REVIEW

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Abstract

Smart parking systems typically get information only regarding accessible parking areas. All smart cities commonly face a key problem related to parking facilities and traffic management systems. Due to vehicles in a no-parking zone, several folks ought to face traffic problems. Therefore, to reduce this, projected work combines IoT and cloud. The target of the projected work is to create a model, "Detection and Identification of Vehicle's No-Parking area using IoT and cloud", that helps the drivers to acknowledge the present parked space. No parking area is detected by making use of geolocation of vehicles with the assistance of a real-time cloud server. Projected work does not simply reduce the traffic jam, but it is collectively giving user authentication, cost-efficient and real-time. This method is enforced by putting geolocation, real-time cloud server, a microprocessor for instant data assortment and no-parking detection mobile-application into service. There will be no wastage time anymore searching for a parking space because the parking space will find them.

Keyword- Cloud Server, Internet of Things (IoT), No Parking, Parking, Raspberry Pi, Real-Time, Real-Time No Parking

1. Introduction

We have analyzed various papers for the implementation of this system. Those papers have given many technologies through which we can build this system. For example- A detection system using a high-quality camera, using ultrasonic or high-frequency sensors, etc. From all these papers we found some information which we needed for implementation. These systems have some disadvantages/cons, some of them are recovered in our system. Systems have been analyzed as per the requirements from detection to navigation and allocation also. Advantages and disadvantages are ought out from the related existing systems.

Nowadays, occupancy capacities of most of the towns have reached their peak as a result of over half of the residents of the globe lives within the urban areas of cities. Increase in number of vehicles is obvious with increase in population of the city. Because of this people faces many traffic issues and spend their precious time finding the appropriate parking area to park the vehicle. It's a very ridiculous job to search for a place to park the vehicle in a crowded city. Due to this many of us park their vehicles in any no-parking space which then causes a big traffic issue. Using our system, the driver will immediately let know that his vehicle is parked in the parking area or not. We are using a GPS sensor to recognize vehicle status. The user will get alert when the vehicle is in no-parking space and if drives choose, the projected system will drive him safely to the nearest parking area. All the users will be able to add their parking area or no-parking area through a web application of the projected system. This will help the drivers to recognize the life of each driver. This technique will not prevent the driver from parking their vehicles in a no-parking area, but also it will help them not to waste their time anymore searching a space for parking of their vehicle because the parking space will find them itself.

Fig. 1: System Block Diagram

In the populated area of the city finding a place for parking is very difficult. This is why most people park their vehicles in the no-parking area which then causes a big traffic issue. Using our system, the driver will immediately let know that his vehicle is parked in the parking area or not. We are using a GPS sensor to recognize vehicle status. The user will get alert when the vehicle is in no-parking space and if drives choose, the projected system will drive him safely to the nearest parking area. All the users will be able to add their parking area or no-parking area through a web application of the projected system. This will help the drivers to recognize...
the no-parking area. Every user will have to register their vehicle to the projected system. Users can register themselves to projected system through the android application or the web application by just following a few steps.

2. Survey

2.1 Survey I: “An IoT-based E-Parking System for Smart Cities”

The system of E-parking projected in this survey contains subsequent elements. Those are “parking meter, a WLAN or Wi-Fi integrated laptop/workstation (also known as local parking management) several on with some Wi-Fi access points (APs) deployed inside each parking facility and a central server for providing parking availability information throughout the city and receiving parking zone reservation request from the driver of a vehicle[1].

The system of parking given in this survey gives a town-wide management of parking information by giving the management facility of parking as well as E-parking reservation system and that system is named as “Parking Meter (PM) based E-parking (PM-EP)”. The researchers in [9] have given a parking system that negotiates and guides with the help of mobile agents that quickly negotiates between the facilities of parking and the vehicle. The resources which are based on cloud have been utilized as service [10]. This survey gives the paradigm of system of E-parking that gives new management system of parking for different parking spaces all over the city.

This projected system will detect the vehicles’ inappropriate parking in parking space & calculate the approximate parking space's occupancy time by another vehicles using an in-built component that is positioned at every parking space. The projected system conjointly allows the automated assortment of charges of parking by giving smart payment choices to the drivers.

2.2 Survey II: “IoT Based Sensor Enabled Smart Car Parking for Advanced Driver Assistance System”

The system projected in this survey not just gives ease for vehicle parking to the user. However, it decreases the traffic which generated because of the deadlocking of vehicles while parking and it reduces the power source consumption of the vehicle by ignoring unwanted traveling through occupied parking spaces which then reduces the carbon dioxide emission in the air.

The projected system is modeled for 3 parking spaces which have one IR device alongside a customizable sensing limit. Projected work not just decreases the traffic jam but also provides user authentication, price-efficient, instant & decreases the carbon.

The work projected in this system points to the problem of most of smart cities regarding parking. This system is developed with “IR sensors of minimum-cost, Raspberry pi model 3b, a mobile application, and a DC motor”. The system is configured for various cases like one user booking, many users booking and authentication.

2.3 Survey III: “An Android Application for Smart Parking with Efficient Space Management”

In this paper, there is a module, the user can allow others to park their vehicles in the user-owned area and return user will get rent, the amount of parking rent will increase as the parking place gets congested. The importance is given to space management in the parking area. In parking, security is provided to each of the vehicles in the parking area. The smart parking and land renting system given in this paper detects the available and unavailable parking slots and land for rent.

These unproductive situations occurred due to a shortage of proper technologies available in smart cities. A manual technique used in the previous old system, now they have turned into an automated and computerized system.

The projected system is a high-efficient car parking in a real-time and fast world. The driver just has to go to the parking place whenever he needs a place, the administrator will help the driver to get the nearest parking place.

2.4 Survey IV: “PSPS: An Android IoT Based Predictive Smart Parking System”

Most of the time drivers do not have an idea where to park their vehicle or availability of parking area. This problem generates some results such as increasing traffic congestion, wasting time and burning fuel. This is a difficult task to find a place for parking and also it is parking space and manpower wastage. This system is dynamic.

The projected system of this paper shows the real-time data and the information about the vacant parking space. The “Estimated Time of Arrival (ETA)”, the value of the availability of parking space is dependent. Therefore, the driver knows available parking space and the driver goes to the parking location directly rather than searching a place for parking. This data is gathered from a network of sensors in the parking space.

This system helps the driver in a crowded city to reach an available parking place of their own choice. The driver fixes their traveling path to a parking place. To reduce the problems and obstacles that drivers face, various systems for routing assistance had been implemented. To monitor the vehicles which are arriving and leaving the RFID sensor is deployed in the system given in this paper. With the maximum possibility of availability of parking places, the driver is navigated to the available parking place.
2.5 Survey V: “IoT - based No Parking Notifier System”

In many cities, drivers spend 2-4 hours in traffic jam daily [11]. Each person in the city who have a vehicle will have a bank account. In that bank account driver will have to deposit an amount. The projected system in this paper provides an app to the peoples live in the city. Whenever the vehicle is in no-parking area, RFID scanner will read the ID number of that vehicle from the database and will send this data to the application and also it will notify the vehicle owner about no-parking and the amount deduction as fine from their bank account. It helps the department of traffic and common people to tackle traffic related problems. This technique principally uses the hosting of the application and performs operations on a processor that is running on another application. The RFID tag number is scanned by the RFID (Radio Frequency Identifier) scanner from the vehicle and then this information is sent to the cloud through Esp8266.

Fig. 2: Block diagram of this system


Many tries had been done to solve the traffic issues, but many of them need different types of a sensor network to detect the existence of a vehicle. They provide a customized web-based system where the user(s) can add, delete or book parking slots.

They provided the presentation layer which takes data as an input, processes it and gives output information. The logical layer is used to determine a vacant parking place using an application built using Python along with OpenCV by keeping each region of interest and the processing separate, to make the system faster while processing the availability status (available/reserved) of every place. The persistence layer is used to save all the data which is necessary to the logical layer for processing and, it is saved and fetched whenever required.

Fig. 3: High-Level System Architecture

This system provides routing to the nearest available parking place. This system has three levels in their architecture, which are Web-based interface, parking detection module / Web service module and Local storage / Web storage.

3. PROPOSED SYSTEM

Fig. 4: Proposed System

Our device will send geolocations of the vehicle to the server for processing. When the vehicle will halt the server will check whether the vehicle is in the parking zone or a no-parking zone or any unknown zone. The server will compare the current location with the existing locations stored on the cloud database and it will send an acknowledgment to the device. If it is positive, then information about the current geolocation area will be displayed. If the response is negative, our mobile application will alert the user that the vehicle is parked in the no-parking area.

Also, after a particular time-span, the device will start giving a beep. There is another utility like vehicle virtual lock, previous history in the mobile application, web-based dashboard.
4. Conclusion
We conclude for this system we build hardware that performs all this task. So, the system gives alert only when the vehicle is in NO parking area. This system consists of two parts. One is an android application and the second is web application. Also, the authorized person and other shopkeepers can mark their parking zone.

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