Parking Availability for cars using IOT Technology

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Abstract: The fundamental issue in today's swarmed stopping office is clog and finding an empty parking spot. In this paper, a route strategy is recommended that minimizes the stopping time, in view of gathered constant opening data of stopping spaces. In the proposed technique, a focal server in the stopping office gathers the data (utilizing IR sensors) and assessments the inhabitance of every stopping openings. At that point, the server utilizes this data gathered as a part of on going to figure the best reasonable stopping space for the client upon demand. This way is then sent to client's advanced mobile phone as reaction by the server which will then be shown on an android application. In vast occupied urban communities, to locate a void stopping space is extremely difficult. We are additionally uninformed of the current stopping openings in the essential region. Along these lines in this paper, we proposes a Smart stopping framework. In this framework, we will keep up a focal server, in which data about the enrolled stopping is put away. This framework proposes a safe and proficient stopping framework which will take a shot at sensor correspondence and secured remote system. The focal server will likewise keep up the include of the unfilled openings the stopping office and it will demonstrate it to the client. As needs be, the client will choose appropriate stopping zone. In view of this, the evaluated most brief way to the chose stopping will be figured and appeared to the driver. Utilizing this framework, we can effortlessly find empty space for stopping and stopping holding up time is decreased efficiently. In this framework, we take care of the issue of activity clog utilizing route technique. We offer a framework that can without much of a stretch find empty space for stopping. We plan a focal server that keep up data about the enlisted stopping zones. It additionally keep up the tally up of accessible space in the stopping ability and transmit it to the client. So the client can without much of a stretch take choice in view of the closest stopping accessible. In this manner by utilizing route method, the client can get the most limited way to the chose stopping zone to keep away from congestion. Therefore the stopping holding up time is decreased effectively.

Keywords: RFID, Infrared sensor, ADC, AVM, SDK, microcontroller.

I. INTRODUCTION

Taking a gander at the present situation in stopping framework, it is watched that it is not proficient by any stretch of the imagination. The present stopping regions have no administration framework i.e. individuals haphazardly stop their vehicles I these extensive stopping ranges as per their accommodation on either section or exit. Furthermore it is difficult for an auto driver entering an expansive stopping office to know which stopping zones are empty. Also, once an auto is stuck in a congested range, it even takes more time to escape the zone. This prompts to more prominent time utilization and requires more difficult work. Additionally, this causes congested roads and here and there wastage of parking spaces prompting to lesser income era. In this paper, an Android application will be created that will empower a client to send data like his span of remain for parking

space over the system without giving out individual data to the stopping office server. This will give the client a briefest way to the most helpful parking area close him/her staying away from clog in the parking area. The point is to bring this fantasy into reality utilizing the product advancement unit (SDK) that has been given by Android, and building a server which will accumulate data of all the accessible stopping spaces utilizing IR sensors.

II. EXISTING SYSTEM

The current strategy is irregular stopping of vehicles as indicated by driver's accommodation. In this strategy a man needs to manage every single vehicle to suitable areas which are ordinarily not took after or even miss-guided. In this technique, area reporting must be done physically by the stopping office worker to the auto driver. Likewise the installment framework is still manual making the procedure dull and protracted. Autos need to remain in line for their turn and close by exchange happens which is moderate.

III. RELATED WORK

Paper [1], Proposes a navigation method that reduces traffic congestion time by using real time information about parking slots. This paper had used many algorithms for allocating vehicles to available parking slots. Simulation based evaluation is done.

In paper [2], Available parking slot detection and tracking system is proposed that fuses the sensors of an Around view Monitor(AVM) system and an ultrasonic sensor-based automatic parking system. This helps driver to select available parking slots and support the parking control by updating the information about parking slots.

In paper [3], Real time monitoring system for parking space management services proposed a system, which provides information to user about available parking slots and provide information to management team to monitor the status of available parking slots.

In paper [4], Design and implementation of smart parking management system based on RFID and Internet proposed a Parking management by using RFID tags and internet connection. Availability of parking space problem is solved by this paper.

IV. PROPOSED METHOD

Assumed:

It is assumed that driver have smart phone and have installed the android app and have internet connection.

Overview:

In parking slot, when driver park their vehicles in sensor registered parking slots. IR sensor scans the slot and sends the updated status to server. User uses the pre-installed app to see the available parking slots. Application fetches the updated information form server and that information is made available to user to reduce the traffic congestion problem.

First user registers using android app and login to central server. User will check availability of parking slots using GUI of android app. Here, central server comes in the picture which maintains the updated status of sensor registered parking slot. Through micro controller it gets the updated status of sensor. That status is made available to user through GUI of android app.
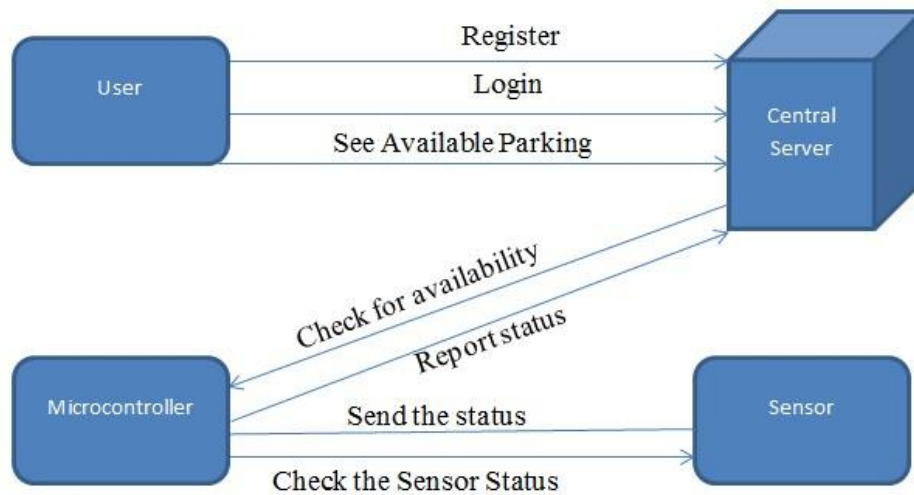
Architecture Diagram:

Figure1. Architecture Diagram

Server Side

The Server side is the most critical part of the framework. It handles the aggregate heap of the clients (auto drivers) demands and answers them with proper courses. At the point when the client enters the stopping office, he opens his application and enters the 'term to remain'. This field information is then sent to the server for the best stopping space assignment. The server on getting the clients ask for runs the information through a calculation which is extraordinarily intended to maintain a strategic distance from blockage in the stopping office. As indicated by the length to continue through to the end opening is designated, wherein the server apportions the client with greatest time the most remote space and the client with negligible time the closest opening to the exit to maintain a strategic distance from car influxes inside the parking spot. The portion of the stopping opening and the course to it is then imparted by the server to the client by means of the application in light of the client's underlying solicitation. While allotting the stopping spaces the server need to think about every last openings status of whether being full or exhaust ceaselessly. For this data IR sensors are introduced in every stopping space transmitting their readings to the server continuously. The server will keep up a cluster memory to store the opening related information as 1/0 where 1 being full and 0 being unfilled. So the server utilizes this information from IR sensors identifying with the opportunity of the stopping openings progressively to speak with the client and give him the best empty stopping office. The second errand of the server is likewise to deal with the RFID record of the client. On the section and leave the individual time logs are made to the server by the RFID scanners set at the toll entryways. At the point when the client leaves the place and the leave time is enlisted in the server, the count of sum happens. The sum is figured on the premise of the time the vehicle spends inside the stopping office. The cost pieces are pre-entered in the server and in like manner the sum is deducted from the clients RFID account kept up by the database.

Client Application

Customer application comprises of the application on the client side. This application has a login page and a page to enlist for new clients. The application speaks with the server utilizing web association. The application goes about as a guide for the client to direct him to his stopping space. In the wake of signing in the application the client need to enter a field 'length to stay' which is then conveyed to the server. Accordingly the application gets information from server with respect to the stopping space to be utilized. This information is appeared to the client in a graphical way which can be effectively reasonable and interpretable.

Sensors

Infrared sensors or the IR sensors are low recurrence light emanating diodes which are put deliberately in every stopping opening everywhere throughout the stopping office. Every IR utilized as a part of the framework is a detached IR sensor which

must be ceaselessly in working stage and send its information to the server progressively. The equipment interfaces the information from IR sensors to the server. While perusing this information in a nonstop sustain the server has predefined edge cutoff points to check if an auto is stopped in the stopping space or is it empty. The base and adage limit for the recurrence readings are settled on the normal ground leeway of every vehicle, wherein a games auto may have a low ground freedom and a games utility vehicle may have a high ground leeway.

V. SYSTEM REQUIREMENTS

Hardware components:

1. ADC (Analog to Digital Converter): ADC0808 IC is used to convert analog to digital all sensors are connect to ADC IC. It is used for sensor values.

2. Microcontroller 89C51 IC: 8 bit microcontroller. It has 8- bit bidirectional ports that are P0,P1,P2,P3. It has inbuilt UART for serial communication.

3. MAX 232: It converts signals from an RS-232 serial port to signal suitable for us in TTL compatible digital logic circuit.

4. ULN2803: It uses the low level(TTL) signal to switch on/turn off the higher voltage/current.

5. Sensors: We use Infrared Sensors for car detection in the parking zones. Each of the sensor nodes determines the occupancy status of a parking space without regard to the types of sensors involved. The sensor nodes should read sensor data at a relatively high sampling rate to tell whether a car is entering or leaving a parking space. The sensor node in a parking space measures the values of the AMR sensor periodically (e.g., 3 seconds) and wirelessly transmits the sensor values only when they show abrupt variations.

Software Requirements

Android OS:

Android is a Linux based operating system design primarily for touch screen mobile device such as smart phones and Tablet computers. Initially developed by Android, Inc, which Google backed financially and later bought in 2005,Android was unveiled in 2007 along with the founding of the Open Handset Alliance: consortium of hardware, software and telecommunication companies devoted to advancing open standards for mobile devices. The first Android powered phone was sold in October 2008.

VI. OBJECTIVES

1. Install the parking application on the client side. The user needs to install the parking application on his/her Android phone.

2. Register to system for parking. There is necessary to register every customer with the unique RFID.

3. System generates the information and update database of register user.

4. The system automatically generates the information and data is updated to database of respected registered user.

5. User can check the availability of parking slots. The system maintains the availability of the vacant parking slots in the parking zones.

6. Maintains the status of the car. The system maintains the status of the car entering the parking zones,whether the car is entering or exiting the parking.

VII. CONCLUSION

In this paper, an efficient and beneficial method is proposed that reduces the traffic congestion. It also reduces the need of manpower. Also this method reduces the usage of paper ensuring green system. This system can be further be extended for

booking parking slots for vehicles for some time period from advance. The mobile application can be further extended upon various OS like IOS, windows etc.

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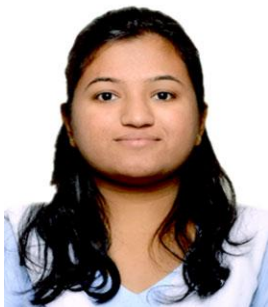
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