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VEHICLE PARKING PLACE FINDER USING DISTANCE OPTIMIZATION

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ABSTRACT

The system provides and secures implementation exchanging parking spot availability information. Trustful information sharing is crucial in order to support the decision of whether the querying vehicle should rely on the received information about free parking spots close to its destination and thus ignore other potentially free spots on the way. Therefore, we propose Parking Communities, which provide a centralized and dynamic means to establish trusted groups of vehicles helping each other to securely find parking in their respective community area. Our approach is based on high-performance state-of-the-art encryption and signature algorithms as well as a well-understood mathematical trust rating model. This approach allows end-to-end encrypted request-response communications in combination with geo information. The system share exact information about availability based on optimized distance based priority

KEYWORDS: web based spatial decision support, Restful API, Mobile client, Distance optimization, Security.

INTRODUCTION

In metropolitan areas, most vehicle drivers have the daily concern of finding a vacant parking space especially during the rush hours. So, many parking management systems have been deployed in order to reduce such traffic congestion and improve the convenience for vehicle drivers.Current systems cannot guide the drivers to their desired parking destinations. Currently, most of the existing car parking system are manually managed and a little inefficient.In urban areas, where number of vehicles is higher as compared to the availability of parking spaces, a lot of time being wasted in searching for parking locations [1].Hence online parking space prediction and booking system is a proposed method that users can reserve their parking places using web and mobile based clients.

Parking Locator App can come in real handy, as long as you remember to save your car's location before you leave the vehicle. They all work about the same by utilizing your GPS – some are very simple and free, but get the job done and others are more sophisticated and may even cost a couple of bucks. However, if used correctly, you will never have trouble locating your vehicle again. We chose ten out of the very many that are offered, so take a look and see if this type of App could be helpful for you.Is an App devoted to finding you a place to park in the first place. It is the world's largest and most accurate database of parking information for over 500 cities around the world. Helps you find the cheapest and closet parking around the city.

PROBLEM AND DEFINITION

Provides information in distributed environment on exiting vehiculartechnology.Information exchanged over a network by using Traditional algorithm, which implies high computation cost.Forecasting the information about parking place is not much easier, since it's available in individual environment

PROPOSED WORK

The System provides information in centralized environment on common web service. Information exchanged over a network by using AES implementation, which advent in high security.Forecasting the information about parking place is much easier, since it's available as central web service, and user friendly mobile application

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MATERIALS AND METHODS

A.Server Module

Server Module has been implemented for the purpose of providing business- customer service in a web service environment. Every car parking location will have a system which automatically update the free and reserved parking spaces and synchronies it with the global Database, wherein all information are supplied to end user (customer/ driver) who makes query via website or mobile client application .Authentication based common web service shared commercially for those people are requested to use this service. In the whole system server part play vital role for uploading / downloading parking information between server and customer and parking places.

B.WSDSS Module

A web-based Spatial Decision Support System (wSDSS) aimed at generating optimized vehicle routes for multiple vehicle routing problems that involve serving the demand located along arcs of a transportation network. The wSDSS incorporates Google Maps™ (cartography and network data), a database, to generate routes and detailed individual vehicle route maps. The wSDSS can be used for "what-if" analysis related to possible changes to input parameters such as vehicle location, maximum driving shift time, distance to travel, available route to reach destination via just a web browser or mobile client application. This part act as main supported Library where it Provide a bridge service for REST full API implementation.

C.Admin Module

Admin module provides feasible interface for managing the user role holder like regular end user, parking owner and their payment and login credentials and changing user status like enabling, disabling via interface.

D.User Module

User is important role holder of an application. The proposed system has two type of user like parking owner and end user (driver/ customer), those are playing main role of the application.

Owner can manage their parking spaces for the availability. They able to add additional space or reduce the spaces (in case of work progress in the environment) end user is customer/ Driver those are searching available spaces and finding nearest places to know about parking spaces. They canevent integrate play process if they wish to book a parking spaces.

E.Client Module

Mobile client application is available to download and use for customer who is intended to use this parking service. The mobile application support android platform based mobile user. Wherein the application support Google map for the purpose of fetching current location, fetching nearest parking station, plotting route between current location to all fetched parking station, calculating time to travel and kilo meters, showing available free and reserved spaces, and payment based reservation

Figure:

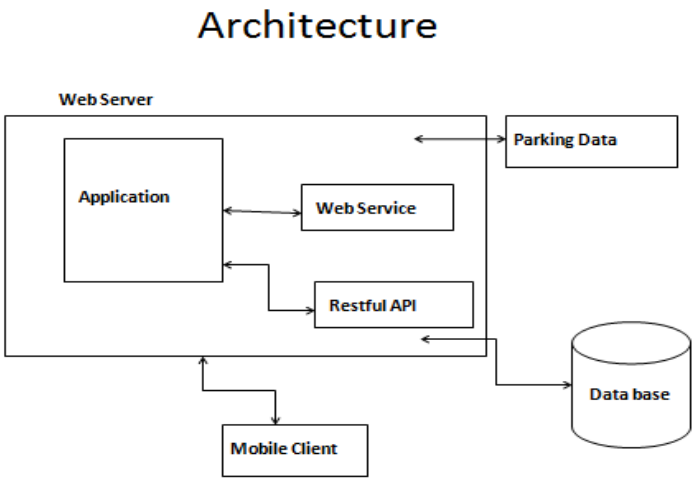

Fig.1: Architecture

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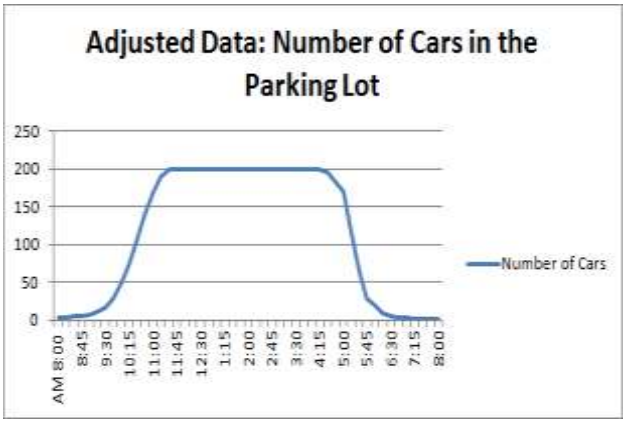
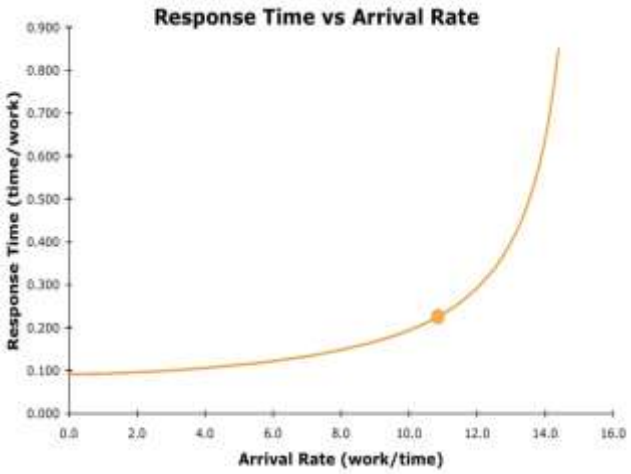
PERFORMANCE EVALUATION

This graph shows the percentage of total slots occupied in the system with respect time. In this graph we can see that as the time advances the number of occupied slots increase too, but this would not be true always, as when cars would leave the system the graph would indicate a reduction in value thereby showing that the slots are empty in the system This is the most important parameter and is found out after space modelling. In this case we can see that how efficiently the space has been modelled in our system, the higher this index is, the more efficiently space modelling is working in our system





ALGORITHM AND TECHNIQUES

A.Advance Encryption Standard

AES is a variant of Rijndael which has a fixed block size of 128 bits, and a key size of 128, 192, or 256 bits. By contrast, the Rijndael specification *per se* is specified with block and key sizes that may be any multiple of 32 bits, both with a minimum of 128 and a maximum of 256 bits.AES operates on a 4 × 4 column-major order matrix of bytes, termed the *state*, although some versions of Rijndael have a larger block size and have additional columns in the state. Most AES calculations are done in a particular finite field.

The key size used for an AES cipher specifies the number of repetitions of transformation rounds that convert the input, called the plaintext, into the final output, called the ciphertext. The number of cycles of repetition is as follows:

- 10 cycles of repetition for 128-bit keys.
- 12 cycles of repetition for 192-bit keys.
- 14 cycles of repetition for 256-bit keys.

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Each round consists of several processing steps, each containing four similar but different stages, including one that depends on the encryption key itself. A set of reverse rounds are applied to transform ciphertext back into the original plaintext using the same encryption key

1. KeyExpansions—round keys are derived from the cipher key using Rijndael's key schedule. AES requires a separate 128-bit round key block for each round plus one more.
2. InitialRound
    1. AddRoundKey—each byte of the state is combined with a block of the round key using bitwise xor.
3. Rounds
    1. SubBytes—a non-linear substitution step where each byte is replaced with another according to a lookup table.
    2. ShiftRows—a transposition step where the last three rows of the state are shifted cyclically a certain number of steps.
    3. MixColumns—a mixing operation which operates on the columns of the state, combining thefour bytes in each column.
    4. AddRoundKey
4. Final Round (no MixColumns)
    1. SubBytes
    2. ShiftRows
    3. AddRoundKey.

B.Distance optimization:

1. Identify what value is to be maximized or minimized.
2. Define constraints
3. Draw a sketch or a diagram of the problem.
4. Identify the quantity that can be adjusted, called the variable, and give it a name, such as *x*.
5. Write down a function expressing the value to be optimized in terms of *x*.
6 Differentiate the equation with respect to *x*.
7. Set the equation to 0 and solve for *x*.
8. Check the value of the function at the end points.

ABOUE STEPS ARE APPLIED GIVEN BELOW EQUATIONS
Equation to Optimize:

$$\text{distance}^2 = (x0 - x1)^2 + (y0 - y1)^2$$

C.Restful API:

REST is a web standards based architecture and uses HTTP Protocol for data communication. It revolves around resources where every component is a resource and a resource is accessed by a common interface using HTTP standard methods. REST was first introduced by Roy Fielding in year 2000.

In REST architecture, a REST Server simply provides access to resources and the REST client accesses and presents the resources. Here each resource is identified by URIs/ Global IDs. REST uses various representations to represent a resource like Text, JSON and XML. JSON is now the most popular format being used in Web Services.

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RESULTS AND DISCUSSION

A: Parking locator

Fig: 3.1 Google Map

Fig: 3.2 Parking Lot1

Fig: 3.3 Parking Lot 2

B :Parking Booking

Fig: 3.4 Parking Lot3

Fig: 3.5 Payment Booking

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C: Parking Conformation

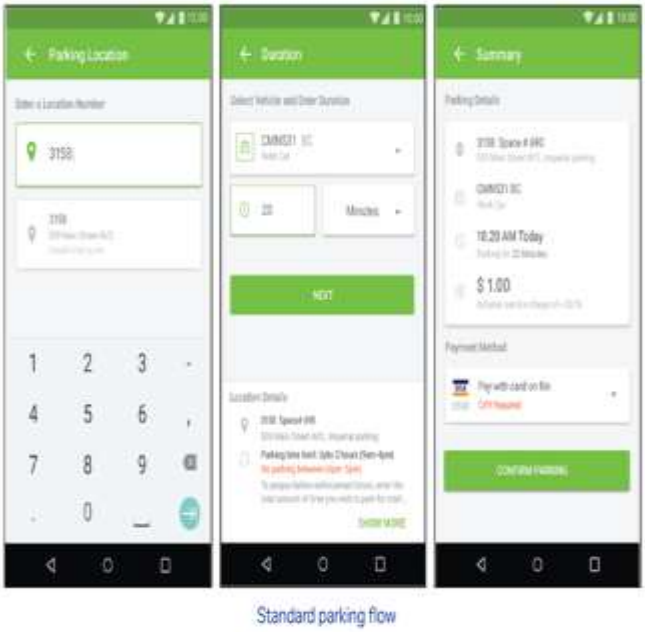

Fig: 3.6 Duration And Conformation Booking

CONCLUSION

As conclusion, the objective of online booking parking system has been achieved. The difficulty of searching available parking lots has been completely eliminated by reserving lots via the proposed system. Users can get learn about parking areas for particular locations.It saves user time in search of parking space available in such a long parking area.

FUTURE ENHANCEMENT

In the further development of this android app plan to make the app more advance by adding more support and additional functions to the system.Also plan to use credit card payment gateway instead of PayPal**.**

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