

**A location based smart emergency car parking system for user sensor.**Pooja Barve¹, Nikita Hagawane², Arti Deshmukh³, Prof A. K. Dere⁴^{1,2,3}Student, JCOE, Department of Computer Engineering, Kuran⁴Assistance Professor, JCOE, Department of Computer Engineering, Kuran

Abstract - Parking in major cities, significantly with dense traffic, directly affects the traffic flow and people's life. During this paper, we tend to introduce a brand new good parking system that's supported intelligent resource allocation, reservation, and rating. The planned system solves this parking issues by providing warranted parking reservations with very cheap doable price and looking time for drivers and therefore the highest revenue and resource utilization for parking manager. New honest rating policies are planned which will be enforced in observe. The new system is predicated on mathematical modeling victimization mixed-integer applied mathematics (MILP) with the target of minimizing the whole financial price for the drivers and increasing the use of parking resources.

Keywords- GPS, Pricing engine

I. INTRODUCTION

Parking is an upscale method in terms of either cash or the time and energy spent for the "free spot chasing." Current studies reveal that an automobile is position for 95 percent of its lifespan and solely on the road for the opposite 5 percent. If we tend to take European country in 2014 as associate example, on the average an automobile was driven for 361 hours a year in keeping with the British National Travel Survey yielding concerning 8404 hours within which an automobile would be position. Currently wherever would you park your automobile for these terribly long hours? Cruising for parking is of course the first downside caused by the rise of automobile house owners globally. On average, thirty percent of traffic is caused by drivers wandering around for parking areas. In 2006, a study in France unconcealed estimation those seventy million hours were spent once a year in France solely in finding out parking that resulted within the loss of 700 million euros annually. In 2011, a world parking survey by IBM states those twenty minutes is spent on the average in finding out a in demand spot. With these statistics, we are able to assume that an excellent portion of world pollution and fuel waste is said to cruising for parking.

Parking areas are found to be quite masses in some places and really rare to find in others. Evaluation policies had a very important role within the overall parking accessibility for many years. Here comes the necessary question: ought we to have a lot of parking areas or will we want higher parking management? We tend to believe it's the later and therefore the motivation behind this work is concerning higher parking management with honest and profitable evaluation policies. According to historical knowledge, the costs are increased and cut proportional to the expected utilization. Though dynamically dynamic parking costs shall balance the provision and demand for parking and increase overall utilization, it's supported historical knowledge and statistics which cannot be correct enough to possess the right result.

II. PROPOSED SYSTEM

We gift a brand new good automotive parking system, named iParker, with static resource programing, dynamic resource allocation and evaluation models, to optimize the parking system for each parking managers and drivers. The contributions of our work include: 1) increasing parking resource utilization, 2) increasing parking revenue, 3) rising parking expertise of drivers by lowering price, parking spot looking and walking times. Our work is completely different from the one in wherever a dynamic resource allocation model was planned. The most limitations of that model area unit that solely reservation for restricted amount of your time (e.g., few minutes) was allowed, mounted value was used and revenue wasn't taken under consideration and solely one alternative of destination was thought of. Whereas our model permits a driver to order an automobile parking space for any time in future, the revenue is taken into account and new evaluation models area unit introduced. If the user needs to order a slot for parking then he/she should seek for the close parking places that provide the list of close parking places with details then the user selected the parking place more user

pay the number. Admin checks for the slot availableness and allot the slot to the user. We have a tendency to use the User location to fetch the close parking places.

III. SYSTEM ARCHITECTURE

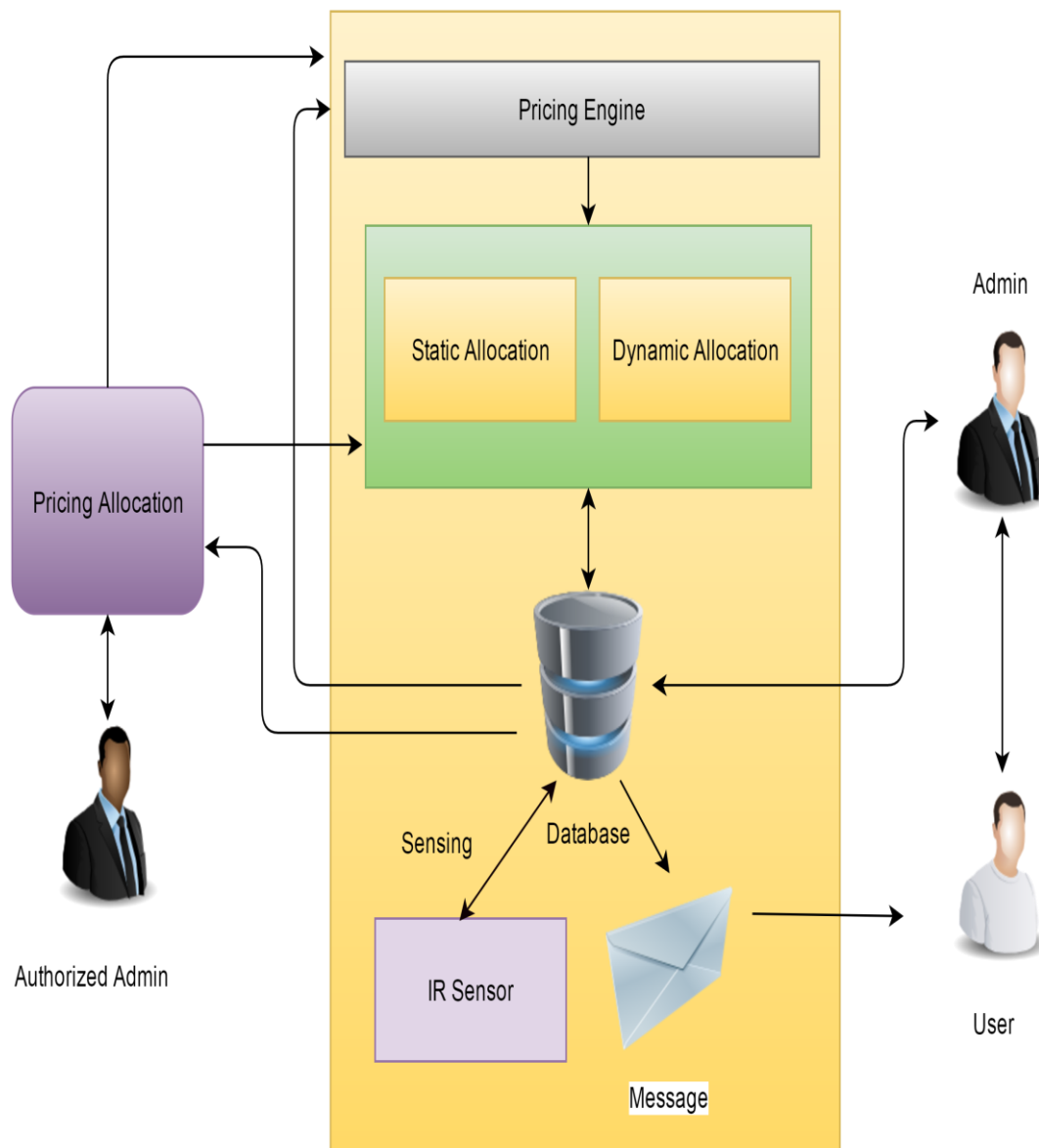


Fig 1: Architecture diagram of proposed system

iParker may be a semi-distributed system as shown in Fig. 1 it comprises the Authorized Admin, pricing engine, Admin, User, info etc.

The Authorized Admin may be a central parking manager WHO is associate interface among parking authorities, parking resource managers, native rating engines. Parking authorities will use the licensed Admin to manually update the relevant pricing engine or information center. As an example, fix rating values sure enough parking resource or update the information center with forthcoming events close to a relevant resource.

Below we tend to describe the most elements of a iParker system

3.1 Pricing Engine

Pricing engines square measure little applications that run an evaluation model on web-servers. The duties of an evaluation engine square measure to fetch parking utilization knowledge and updates from parking authorities each predefined measure and to line the new parking costs consequently. The engine runs freelance on the SAS, calculates the new costs and updates the info center.

3.2 Database

Holds all the data from all iParker elements and store them in very structured data instrumentation. It's consisted of a rating table that contains the up to now info on rating per resource per minute utilization table that holds the employment information, and finally authority table that stores alternative parameters that's set by parking authorities (e.g., events related). Info is additionally to blame for change multiple sorts of virtual message signs and public devices of up to now rating info and parking convenience.

3.3 Message

This updates parkers/public with up to now rating and parking availableness info. It's necessary to say that a parker can solely pay per the worth rate fixed within the reservation supply. If the parker isn't exploitation the service, he/she can pay per the worth rate displayed at the time of his/her parking.

3.4. Third-Party Provider Solutions

Last few years, a big range of third-parties providing to deliver alert messages (and different info services) via text electronic messaging services. The design of those systems is comparatively straightforward. Whether or not activated through an online interface, directly from a phone, or as software system running on a field administrator's laptop, these services act as SMS aggregators and inject text messages into the network. Within the event of Associate in Nursing emergency message is shipped to the service center from the victim or footer mobile.

3.4.1. Short Message Service

Short Message Service (SMS) could be a text electronic communication service element of phone, web, or mobile communication systems, exploitation standardized communications protocols that enable the exchange of short text messages between fastened line and itinerant devices. SMS text electronic communication is that the most generally used knowledge application within the world, with 3.6 billion active users, or seventy eight of all itinerant subscribers. The term SMS is employed as an equivalent word for all sorts of short text electronic communication in addition because the user activity itself in several components of the globe. Straightforward user generated text message services - embrace news, sport, financial, language and placement primarily based services, in addition as several early samples of mobile commerce like stocks and share costs, mobile banking facilities and leisure booking services. SMS has used on fashionable handsets originated from radio telegraphy in radio memoranda pagers exploitation standardized phone protocols and later outlined as a part of the world System for Mobile Communications (GSM) series of standards in 1985] as a method of causing messages of up to one hundred sixty characters, to and from GSM mobile handsets. Since then, support for the service has dilated to incorporate alternative mobile technologies like ANSI CDMA networks and Digital AMPS, in addition as satellite and land line networks. Most SMS messages ar mobile-to-mobile text messages although the quality supports alternative styles of broadcast electronic communication in addition.

3.4.2. GSM Technology

GSM could be a cellular network, which implies that cellphones connect with it by checking out cells within the immediate neighborhood. There square measure five completely different cell sizes in an exceedingly GSM network. The coverage space of every cell varies per the implementation atmosphere. Indoor coverage is additionally supported by GSM. GSM uses many crypto logical algorithms for security. A convenient facility of the GSM network is that the short message service. The Short Message Service – purpose to purpose (SMS-PP) was originally outlined in GSM recommendation that is currently maintained in 3GPP as TS twenty three.040. GSM 03.41 (now 3GPP TS twenty three.041) defines the Short Message Service – Cell Broadcast (SMS-CB), that permits messages (advertising, public data, etc.) to be broadcast to any or all mobile users in an exceedingly nominal geographic region. Messages square measure sent to a brief message service center (SMSC) that provides a "store and forward" mechanism. It makes an attempt to send messages to the SMSC's recipients. If the subscriber's mobile unit is power-driven off or has left the coverage space, the message is hold on and offered back to the subscriber once the mobile is power-driven on or has reentered the coverage space of the network. This operate ensures that the message are going to be received.

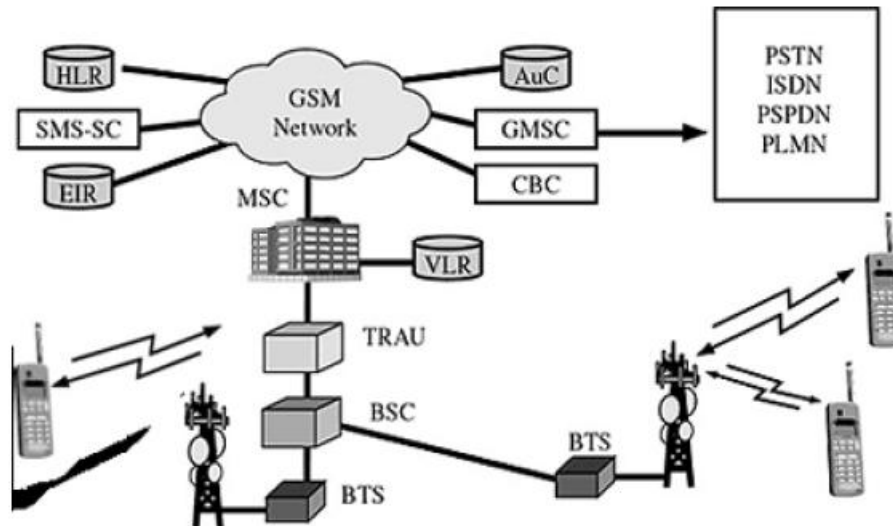


Fig 2: GSM Network along with SMSC

Both mobile terminated (MT, for messages sent to a mobile handset) and mobile originating (MO, for those sent from the mobile handset) operations are supported. In Message delivery, delay or complete loss of a message is uncommon, typically affecting less than 5% of messages.

3.4.3. GPS Technology

The Global Positioning System (GPS), additionally referred to as Navstar, could be a world navigation satellite system (GNSS) that has location and time data altogether climatic conditions, anyplace on or close to the planet wherever there's associate degree unobstructed line of sight to four or a lot of GPS satellites. The GPS system operates severally of any telecommunication or web reception, though' these technologies will enhance the utility of the GPS positioning data. The GPS system provides essential positioning capabilities to military, civil, and industrial users round the world. The US government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver. The GPS conception is predicated on time and also the celebrated position of specialized satellites. The satellites carry terribly stable atomic clocks that square measure synchronized with each other and to ground clocks. Any drift from true time maintained on the bottom is corrected daily. Likewise, the satellite locations square measure celebrated with nice exactness. GPS receivers have clocks as well; but, they're typically not synchronized with true time, and square measure less stable. GPS satellites ceaselessly transmit their current time and position. A GPS receiver monitors multiple satellites and solves equations to see the precise position of the receiver and its deviation from true time. At a minimum, four satellites should be visible of the receiver for it to work out four unknown quantities (three position coordinates and clock deviation from satellite time).

IV. ALGORITHM

4.1.1. AES algorithm

The AES-256 algorithm consists of 3 main parts: Cipher, Inverse Cipher and Key expansion. Cipher converts information to an unintelligible type known as cipher text whereas Inverse Cipher converts information back to its original type known as plaintext. Key expansion generates a Key Schedule that's utilized in Cipher and Inverse Cipher procedure. Cipher and Inverse Cipher are composed of specific number of rounds for its Cipher and Inverse Cipher, the AES algorithmic rule uses a spherical operate that's composed of 4 completely different byte-oriented transformations

- A. Byte substitution employing a substitution table (S-box)
- B. Shifting rows of the State array by completely different offsets
- C. Mixture the info among every column of the State array
- D. Adding a spherical Key to the State

The Cipher transformations will be inverted and so enforced in reverse order to supply a simple Inverse Cipher for the AES algorithm. The individual transformations utilized in the Inverse Cipher.

- A. Inverse Shift Rows
- B. Inverse Sub Bytes
- C. Inverse combines Columns
- D. Add spherical Key

The AES inverse cipher core consists of a key expansion module, a key reversal buffer, an initial permutation module, a spherical permutation module and a final permutation module. The key reversal buffer initial store keys for all rounds and also the presents them in reverse order to the rounds. The spherical permutation module can loop maternally to perform fourteen iterations (for 256 bit keys).

4.1.2 k-nearest neighbor's algorithm

In pattern recognition, the k-Nearest Neighbors algorithm (or k-NN for short) could be a non-parametric methodology used for classification and regression. In all cases, the input consists of the k closest coaching examples within the feature area. The output depends on whether or not k-NN is employed for classification or regression:

- A. In k-NN classification, the output could be a class membership. An object is assessed by a majority vote of its neighbors, with the thing being appointed to the category commonest among its k nearest neighbors (k could be a positive integer, usually small). If $k = 1$, then the thing is solely appointed to the category of that single nearest neighbor.
- B. In k-NN regression, the output is that the property price for the thing. This price is that the average of the values of its k nearest neighbors.

K-NN could be a kind of instance-based learning, or lazy learning, wherever operate is just approximated regionally and every one computation is postponed till classification. The k-NN algorithm is among the best of all machine learning algorithms.

Algorithm:

- A. The coaching examples are vectors in an exceedingly four-dimensional feature house, every with a category label.
- B. The coaching section of the algorithm consists solely of storing the feature vectors and sophistication labels of the coaching samples.
- C. In the classification section, k could be a user-defined constant,
- D. It is an untagged vector (a question or check purpose) is assessed by assignment the label that is most frequent among the k coaching samples nearest to that query point.

V. CONCLUSION

We have projected iParker, a brand new sensible parking system that is predicated on MILP model that yields best resolution for dynamically and statically allocating parking resources to parkers-providing versatile reservation choices. The new ideas introduced during this square measure the mixture of time period reservations with share-time reservations. We tend to even have projected rating policies for each static and dynamic reservation that maximize the take advantage of parking. Intensive simulation results indicate that the projected system considerably cuts the full effective value for all parkers by the maximum amount as twenty eighth maximizes the full utilization by up to twenty first and will increase the full revenue for parking management up to 16%as compared to the non-guided parking system. Finally we tend to projected a dynamic rating theme and by desegregation it to iParker's model, we tend to found by simulations that it balances the employment across all the parking resources and so assist in eliminating the general traffic congestion caused by parking. In the **future**, we aim to evaluate our system using real-time data and greater number of resources and destinations. In addition, a scalability analysis is to be performed to examine the efficiency of the proposed scalability techniques. Last, it would also be useful to simulate different parking arrival scenarios in real life.

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