



IOT BASED CAR PARKING AVAILABILITY ALERT INFORMATION FOR VEHICLE DRIVERS

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Abstract: In this cutting-edge world, the quantity of vehicles is quickly developing once each day, however there is an emergency for space to leave these vehicles. To make an enhance answer for this emergency "An IOT Based Car Parking System" model assists the client with finding a parking spot for his/her vehicle through a portable application. The client can enquiry on accessibility of parking spot closest to his/her area without battle to track down an ending degree and without pondering where there is an unfilled parking spot with the assistance of versatile application that shows the quantity of empty openings in any stopping region and explore the driver to that area. Likewise, this model is being carried out utilizing sensor circuit, IR sensors is utilized to observe the presence of vehicle in separate leaving region and all subtleties are gotten to from a distance by utilizing IOT. This framework utilizes less human collaboration which expands adaptability and security.

Index Terms – IOT, IR, Sensor, Security, Adaptability.

1. INTRODUCTION

Things that have a personality The Internet of Things (IoT) idea was motivated by specialized gadgets. The devices can be followed, controlled, and checked remotely utilizing PCs associated with the Internet. The Internet of Items (IoT) is a between organization of gadgets and actual things, or 'Things,' that utilizes the Internet to convey correspondence. The two most critical words in IoT are "web" and "things." The expression "web" alludes to a huge worldwide organization of associated waiters, PCs, tablets, and cell phones that utilization notable conventions and interfacing frameworks. You might send, get, and impart data through the Internet. The word reference meaning of 'Thing' is a term used to allude to something actual, an activity or thought, when we would rather not be explicit, we're in a situation or busy. The Internet of Things (IoT) is an organization of gadgets and actual items that incorporates an immense number of them. Articles can accumulate information from far off areas and speak with units in cycles and administrations that make do, gain, sort out, and dissect information. It shows a future in which ordinary items (wearables, watches, morning timers, home devices, and encompassing articles) become savvy and act alive because of embedded tiny hardware detecting, handling, and speaking with remote items or individuals through availability. Engineers might make and host developers on distributed computing considering its adaptability and soundness. Since it fills in as a stage for putting away and recovering sensor information from distant areas, the cloud is an ideal ally for IoT. Because of these circumstances, the two advances were coordinated, leading to the Cloud of Things (COT). Bed objects (hubs) might be gotten to, checked, and controlled through the cloud from any spot. Considering the cloud's extraordinary versatility, quite a few hubs might be added or taken out from the IoT framework progressively. The idea of a Smart City is quickly turning into a reality. The Internet of Things (IoT) has arisen. Vehicle leaving offices and traffic signal frameworks are two of the main difficulties in brilliant urban communities. Observing an accessible leaving place in the present urban communities is continuously trying for drivers, and it is just deteriorating as the quantity of private car clients develops. The present situation may be considered a chance for savvy urban communities to find ways to work on the effectiveness of their stopping assets, bringing about more limited inquiry times, decreased gridlock, and less street mishaps. Stopping and gridlock issues can be facilitated on the off chance that drivers are told early with regards to the accessibility of parking spaces at and close to their destination. Recent progressions in building minimal expense, low-power inserted frameworks are helping designers in laying out new Internet of Things applications. Numerous cutting-edge urban areas have decided to carry out various IoT-based frameworks in and around their urban communities to screen, because of advances in sensor innovation. As indicated by a new survey led by the International Parking Institute, there has been an upsurge in the quantity of imaginative stopping framework ideas. As of now, some stopping frameworks guarantee to furnish residents with constant data regarding accessible stopping places. To get valuable bits of knowledge from information gathered from numerous sources, such frameworks require compelling sensors ought to be introduced in parking spaces for inhabitation observing as well as quick information handling units.

2. LITERATURE SURVEY

Finding a proper vehicle parking option has grown critical as the number of automobiles in cities has increased. Traditional parking techniques cannot be employed today since they demand a significant quantity of space, and a large amount of space would be required to satisfy the parking requirement. Because the cost of land in cities has risen tremendously, it is critical that the parking solution uses the least amount of space and can handle the greatest number of cars. In urban locations, the average person spends 10 to 15% of his trip time hunting for a good parking place. A functional mechanism is required for the parking system to function. Furthermore, a sensing device is necessary to assist the user in determining whether a free parking place is available. When creating this system, it is necessary to consider the safety of both automobiles and humans. The numerous types of parking systems and sensors used to promote safety and efficiency are reviewed in this study. For residents in urban cities, finding a sufficient parking place has become a major worry. The main cause is a scarcity of parking spaces. Traditional parking methods are no longer viable since they are inefficient at utilizing space; thus, different parking solutions are required. Tracking parking spots is also important, which may be done with the help of an IoT system with sensors.

C. Roman, R. Liao, P. Ball and M. de Haver proposed "Savvy city plan utilizing IOT". Brilliant city plans have for quite some time been an unrealistic fantasy. Throughout the most recent couple of years, progress has been made toward making the brilliant city idea a reality. The ascent of the web of things and cloud innovations has opened additional opportunities as far as savvy urban communities. Shrewd stopping offices have for some time been at the core of savvy city improvement. The framework transmits and manages parking space data in real time. This post focuses on demonstrating how to save clients time when looking for a suitable parking spot. It helps to alleviate the growing problem of traffic. Clients will want to book a stopping place from a distant area later. Later, GPS, reservation administrations, and a tag per user might be incorporated. A few methodologies have been utilized to make the framework, as indicated by prior comparative distributions. To guarantee a superior update of the proposed framework in this venture, it is basic to know about the frameworks that have been assembled. In a few explorations, picture handling outweighs sensor-based frameworks. The number plate of the driver is captured. The number plates of the drivers are caught through picture handling, and the data is kept in a data set. This is to forestall car robbery and unapproved access. Clients must first register before using the Android application. This application contains essential driver data that will be put something aside for future reference. [1].

H. Arasteh, et al have proposed "IoT based savvy urban communities: a review". Then, at that point, as a solution for the booking traffic, another idea arose, in which the QR code is utilized for reservation affirmation. As the review paper "Brilliant Parking System in View of Reservation" points out, the development of financial conduct for ordinary solace has fundamentally expanded the level of people who own cars, bringing about expanded gridlock in blocked urban communities. This is a typical reason for gridlock and contamination. The first is the halting area, which includes Arduino devices as well as an IR sensor. The client can communicate with the parking garage using these devices. Without the use of a RFID card, the client can't enter the parking spot. The cloud-based web administrations in the subsequent section work as an arbiter between the client and the parking garage. The cloud is refreshed considering the parking spot's accessibility. The head deals with the cloud administrations, which may likewise be reviewed by clients to check for accessibility. The client side is the third area. The client gets a SMS notice considering the accessibility through the GSM module. With the ascent of savvy urban areas, there is a steadily expanding interest for imaginative ways to deal with the issue of mentalities. Because of the Internet of Things, several firms have witnessed considerable growth. Capacity, calculation, and energy were among as far as possible tended to by the Internet of Things. The Internet of Things might work with a wide scope of gadgets and permits them to cooperate and trade information in a standard way [2].

Arasteh and colleagues conducted a poll on "IoT-based smart cities." Wireless Sensor Networks have advanced tremendously from the early ideals provided in the Smart Dust project fifteen years ago, leading to the realization of the Internet of Things (IoT). Today, there is a wide range of easy-to-install and-use gear and software to pick from. Even though a growing number of real-world applications use significant deployments of IoT devices, the wireless nature of communication, along with the devices' low-end capabilities, creates security and privacy concerns that have yet to be adequately addressed. Given the wide range of capabilities among sensor node brands, delivering a single solution is quite difficult. [3].

Vitaletti et al, surveyed various methods on "IoT-based smart cities". Smart cities have been equipped with various electronic devices based on the Internet of Things (IoT), thereby becoming smarter than before, because of the growing breakthroughs in improved metering and digital technologies. The purpose of this article is to provide a complete overview of smart city concepts, motives, and applications. In addition, this survey discusses IoT technology for smart cities as well as the key components and characteristics of a smart city. Furthermore, practical experiences over the world and the main challenges are explained [4]

"Internet of Things based Smart Parking Reservation System utilizing Raspberry-pi," Cassin, Ganesh, and Suresh discussed. The development of a smart parking system is determined by business requirements. Smart parking may take precedence considering retail and healthcare technology trends. Returning to our smart parking system, the following are the primary aspects that could be enhanced: A smart parking system's independent operating time will be extended thanks to the LoRa WAN protocol. The LoRa WAN protocol is optimized for low power consumption, which means you won't have to change batteries more than once every 2-5 years, thanks to the LoRa Alliance's definition. It's also built to scale from a single gateway installation to big worldwide networks with billions of devices. As a result, using this or any other LPWAN protocol for a smart park would be a fantastic idea. Data Science and Computer Vision based on video streams are also ideal for IoT-based developments. For car number identification, Data Science, Machine Learning, and Computer Vision could be used in smart parking development. [5]

3. METHODOLOGY

Users will be notified when parking spaces become available using the suggested method. Instead of waiting in the parking lot, a user can reserve a parking spot in advance, which is displayed on the user's smartphone. IR sensors will be inserted in each slot to detect if it is empty. The signal from the sensors is recorded by Arduino, and it is then transformed from an electrical signal to a different form to identify the presence of a car based on the quantity of light reflected off an object such as a parking lot wall. The amount of light sensed determines the output from Arduino, and slot allocation is based on it. The Arduino's output, on the other hand, is transformed to text and sent via an Android application to cellphones. Users now have access to parking information and may pick which spots they want to book. Aside from the reservation, the customer will be informed about parking details such as extending or paying via a GSM text message. The parking area is detected by the sensors in each slot. Each slot will be detected as

an input by the sensors, and the sensor's output will be sent to the Arduino first. Arduino will process the sensor data, perform analogue to digital conversions, and track the person using the parking space data provided. A sensing device, a communication platform, and a mobile application are all required for this project. Then, as a remedy for the reservation traffic, a new concept emerged, in which the QR code is used for reservation confirmation. This is a common source of pollution and traffic congestion. Drivers will be notified of available parking places by the management system. The drivers will then reserve a specific parking spot. As soon as the drivers reserve a spot, the server generates a unique QR code and sends it to them. Following the reservation, the host will ask for the QR code provided by the user to verify the information and allow the user to use the reserved area. This code stores information such as the parking price and slot availability for both the user and the provider's reference. This system's hardware is separated into three primary components are QR scanner, a server, and a mobile phone.

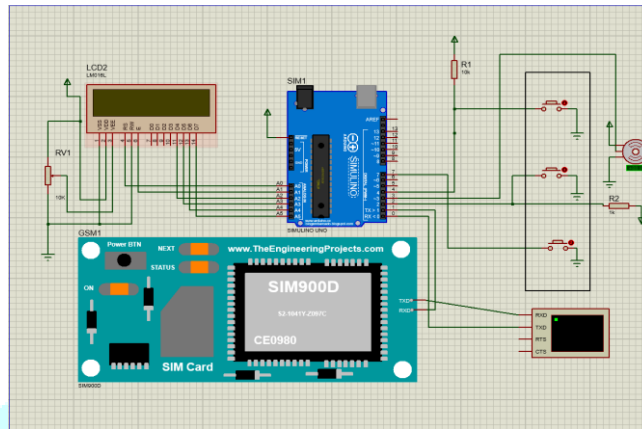


Figure 1: Proteus setup

In the fundamental blueprint of our endeavor, we use sensors (Piezo electric sensor and IR sensor) for information, and GSM module, GPS module, motors (servo motor), sign and LCD show for yield. Also, moreover ARDUINO UNO microcontroller inside it uses for the overall decision maker of the entire structure. The system is created and simulated using PROTEUS to confirm that all components and the system algorithm are operating. The Arduino code is written in C++ and includes a few additional methods and functions that we'll go through later. C++ is a computer language that is easy to understand. When you create a sketch (the word for Arduino code files), it is processed and compiled to machine language. The Arduino Integrated Development Environment is the primary text editor for Arduino programming (IDE). It's here that you'll write your code before uploading it to the board you're programming. Sketches are the name for Arduino code. The IDE has a simple appearance, as you can see. On the navigation bar, there are just five headers, as well as a set of buttons beneath them that allow you to validate and submit your sketches. Essentially, the IDE converts and compiles your designs into Arduino-compatible code. Following the compilation of your Arduino code, it is uploaded to the board's memory. To begin creating their sketch, the user only must push a button (a guide to this can be found below). A warning message will appear if there are any mistakes in the Arduino code, alerting the user to make modifications. Because of Arduino's strict syntactic requirements, most novice users have trouble compiling their code. Proteus is a programmed that allows you to simulate, create, and sketch electrical circuits. The Lab Center for Electronics invented it. Two-dimensional circuit designs can also be created with Proteus. You may use this engineering programmed to build and simulate various electrical and electronic circuits on your desktop or laptop devices. Why there are various advantages to simulating circuits on proteus before implementing them in the real world. Circuit design on the proteus takes less time than circuit assembly.

In software simulation, the risk of mistake is lower, such as a loose connection, which takes a long time to discover in an actual circuit. Circuit simulations have the advantage that some circuit components are not realistic, thus you may build your circuit on Proteus. There is no risk of any electronic component in proteus being burned or damaged. In proteus, expensive electronic instruments like an oscilloscope are readily available. You may use proteus to identify different circuit parents, such as current, the voltage value of each component, and resistance at any time, which is difficult in an actual circuit. I have created parking slots in google using the name "Tirumala Parking slots" if we searched in google with above mentioned name it will provide route to it. GPS module helps us to register in parking slots using phone number for parking the vehicle. Arduino Uno helps us to connect the things with internet we can connect the things such as piezo electric sensor, IR sensor etc. Digital Indicator helps to see how many slots are used and unused slots in the parking section. The button assists in numbering the cars in the slots. The servo meter is used to open and close the entry gate. Face and Image detection helps to detect enrolled face or uploaded license, or uploaded car details are scanned by Face or image detection process. Personal computer helps us to store data related to the entry and exist of the vehicles in the parking slots. User must register by himself on the website of "Tirumala parking slots" by using mobile number. And search in google for slots booking and finding the distance of locations for available slots in the area. The technology provides parking place information and processing in real time. This project has demonstrated various types of smart parking solutions. The effectiveness of the smart parking system in reducing the traffic problem that emerges, especially in the city region where traffic congestion and limited parking spots are obvious, the various examples of its application provided demonstrate this. It does this by diverting customers and maximizing parking space utilization.

4. SYSTEM DESIGN AND ANALYSIS

Making a program fail is the act of executing it with the deliberate aim of detecting faults. It is the process of discovering mistakes and plays a crucial part in quality assurance as well as assuring software dependability. The results of the testing are also employed in the maintenance process. The most crucial component you'll want to regulate for the most dependable parking lot is traffic flow, but it's not the only one. Pay particular attention to the following aspects of your parking lot design are we will clarify about the framework plan development through equipment and advancement of programming. Also, the part expounds the equipment and the programming stage by stage. Every one of the activities of equipment and programming are likewise remembered for this section.

Disadvantages of existing system

For many of the parties involved, using the parking management system provides several benefits. However, it does have certain drawbacks. Some people have been unwilling to use the parking management system because of these disadvantages. These disadvantages, however, can be overcome at any time. Some of the disadvantages include. The high cost of contribution or installation: The parking management system is beneficial to many parties. However, there are several drawbacks to this approach. Some customers have been hesitant to adopt the parking management system because of these drawbacks. These drawbacks, though, aren't insurmountable. Regular maintenance: Although the system is automated, it nevertheless requires business maintenance on a regular basis. This is to confirm that the system is in excellent functioning order and that no errors have occurred. Maintenance might be done once every several months. The parking management system is foreign to many people. As a result, it may be difficult for them to utilize, resulting in additional parking issues. Breakdown: Like any other machine, the system will eventually fail. Vehicles may be unable to approach buildings and automobiles parked inside may be unable to move if this occurs. In another scenario, it might fail and cause automobiles to park in inconvenient locations. Uncertainty in the building structure: A certain amount of building knowledge is required to operate the parking management system. The system cannot be implemented, or installation without understanding of the construction of the building might result in hazards and abnormalities.

Here's how to deal with some of the issues that may arise when you utilize the parking management system.

The issue of greater construction and installation costs You've spoken with the system makers and believed the price quoted is excessive. Consider this When you pay to get the system up and running all at once, you won't have to worry about the side payments you're used to. You get to spend the next month free of any penalties, expenses, or cases that may have developed because of using traditional parking methods.

the sensor generally the data that will be embarked to the controller the programming. The controller is set to finish up how the outcome will be made from the motor and will be displayed at the grandstand part. As the structure requires the usage of microcontroller, the arrangement includes two segments gear, and programming.

When entering the parking lot, it is also checked to see if there are any available spaces or if the driver who requests the gate be opened has a reservation in the database. If everything is in order, the distance from the parking lot is evaluated to avoid a gate closing at a higher distance by accident or design. If any of the conditions aren't satisfied, the motorist is notified that the parking lot is unavailable. Otherwise, the gate will open, and the vehicle will be entered into the parking lot database. Simultaneously, the legitimacy of the driver's reservation is examined, and if it is found to be invalid, it is removed from the database. The technology unlocks the exit gate and deletes the record of your parking place as you leave the parking lot.

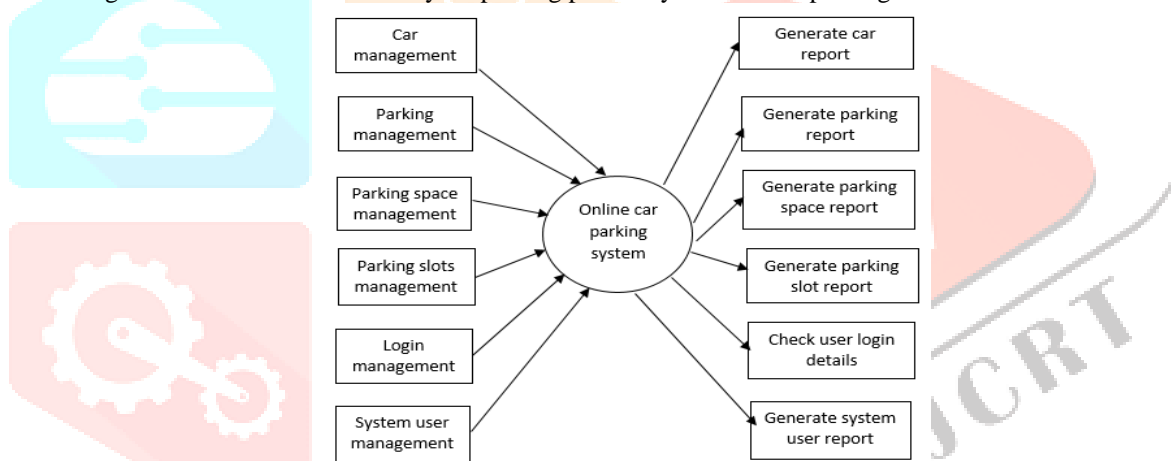


Figure 2: Parking slots management system.

When attempting to make a reservation, the system first verifies that the car is not currently parked in the lot and that its ID has not yet been assigned to a reservation. The accessible spots are then examined. A reservation entry is made in the parking lot's database if all the prerequisites are met. Otherwise, the app will notify the driver that the reservation will be cancelled. The reservation time is restricted to 60 minutes. As a result, the mini-PC on the parking lot checks the database every minute to see if any reservations have surpassed this limit. If this happens, the database entry is removed. He parks his car when he exits the building. I recognized that, especially in a congested metropolis like Dhaka, a better parking system is essential for improved transit. So, I began to consider how to address the issue, and eventually developed a cloud-based smart parking solution. which I believe will address my city's parking problem. ARTIK Cloud is an excellent and ideal platform for this type of work. A user will be able to discover an available parking lot using this method from anywhere using a mobile or web app. I also utilized Intel Edison with a display that could be placed at various key points across the city or along a major road.

Smart city plans have long been a pipe dream. Progress has been made in recent years toward making the smart city concept a reality. In terms of smart cities, the growth of the internet of things and cloud technology has opened new possibilities. Smart parking has long been a cornerstone of smart city development. The technology provides parking place information and processing in real time. This study has discussed the many types of smart parking systems.

This section describes the project's production and communication protocol procedures. The system is created and simulated using PROTEUS to confirm that all components and the system algorithm are operating. The system is then constructed and tested on a breadboard once the simulation procedure has been verified and validated. The system is then built on a PCB and final connection and continuity testing are performed once all system components and tests have been completed. The server application was created with the Larval Framework on an Ubuntu 16.04 server and is hosted by Cloud9. It is based on the following use-case scenarios: each user is unique, registration is done via email, users can make reservations (reservations require a phone number), entrance and exit access codes are generated after a successful reservation, and access codes are sent via SMS and email.

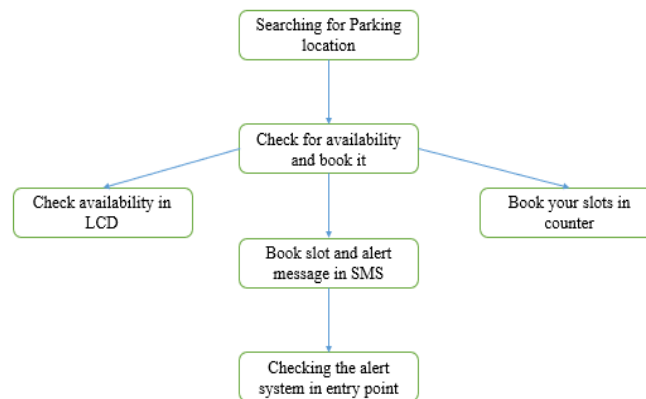
In some present automobile parking spots, there is also unused space. There are more parking spots per car in these areas, and most of them are unoccupied most of the time. To boost sustainability, the necessity, location, and cost must all be addressed, as well as convenience. Despite the popularity of smart parking systems, no citywide solutions exist to connect the diverse public and private

parking providers, leaving them uncoordinated. System Implementation: Making a program fail is the act of executing it with the deliberate aim of detecting faults. It is the process of discovering mistakes and plays a crucial part in quality assurance as well as assuring software dependability. The results of the testing are also employed in the maintenance process. The most crucial component you'll want to regulate for the most dependable parking lot is traffic flow, but it's not the only one. Pay special attention to the components of your parking lot design listed below. Rainwater cannot soak through the pavement, causing damage to the underlying soil. Precautions made to guarantee efficient water drainage are part of what makes asphalt so successful. As part of your parking lot pavement design, use inlets and catch basins, as well as other drainage measures, to avoid standing water on your asphalt. These drainage improvements should be installed as quickly as possible. Parking lot surfaces are often constructed with a slope of at least 2% to prevent water from gathering at the pavement edges.

Face detection and Image detection:

- Imports: import cv2. import OS, CV2.
- Initialize the classifier: casc-Path =OS.path
- Apply face Cascade on webcam frames video capture=cv2. Video Capture (0)
- Release the capture frames: video capture. Release ()
- Now, run the project file using python idle

Flow a diagram:



Algorithm:

- 1) Search for slot availability from your location with google as Tirumala parking slots
- 2) Check weather slots are available or not using maps go there by using google maps
- 3) And at entry point you can see the available slots that are present in the system
- 4) You will get an SMS to mobile phone show to the camera
- 5) And at entrance there will be face detection camera that will scan your face, car number, address, SMS and allows u to enter the parking slots
- 6) Finally, your car presence is sensed by piezoelectric sensor that will automatically reflect into LCD on top of system
- 7) Hence the overtime completion you move your car out of system from end gate which working based on response from scanning and servo motor working process-based motor rolling only car count present and absentee calculated.
- 8) This is entire algorithm for IOT based car parking alert system to the vehicle drivers.

5.RESULTS AND DISCUSSION

The best simulation software for microcontroller designs is Proteus 8. Its popularity stems from the fact that it contains practically every microcontroller. As a result, it's a useful tool for evaluating programmers and embedded designs for electronic users. Proteus 8 software can be used to simulate. Making a program fail is the act of executing it with the deliberate aim of detecting faults. It is the process of discovering mistakes and plays a crucial part in quality assurance as well as assuring software dependability. The results of the testing are also employed in the maintenance process. The most crucial component you'll want to regulate for the most dependable parking lot is traffic flow, but it's not the only one.

I have created parking slots in google using the name "Tirumala Parking slots" if we searched in google with above mentioned name it will provide route to it. GPS module helps us to register in parking slots using phone number for parking the vehicle. Arduino Uno helps us to connect the things with internet we can connect the things such as piezo electric sensor, IR sensor etc. Digital Indicator helps to see how many slots are used and unused slots in the parking section. The button assists in numbering the cars in the slots. The servo meter is used to open and close the entry gate. Face and Image detection helps to detect enrolled face or uploaded license, or uploaded car details are scanned by Face or image detection process.

Implementation of parking slot availability system using proteus and Arduino Uno ide and python ide and counting available slots in the parking area, sending SMS to the user based the registered mobile number and scanning the face or image of car based on the uploaded pics during the process is maintained and managed by GSM module, Arduino Uno, Python IDE, proteus software's are very useful in successful execution and output of the parking slot availability system and alert message to user is concluded.

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Execution

- Run the proteus build virtual arrangement setup.
- Press GSM module button then message will send to resisted mobile about parking slot availability
- Check for total available slots and used slots details LCD.

Discussions

We created parking slots in google using the name “Tirumala Parking slots” if we searched in google with above mentioned name it will provide route to it. GPS module helps us to register in parking slots using phone number for parking the vehicle. Arduino Uno helps us to connect the things with internet we can connect the things such as piezo electric sensor, IR sensor etc. Digital Indicator helps to see how many slots are used and unused slots in the parking section. The button assists in numbering the cars in the slots. The servo meter is used to open and close the entry gate. Face and Image detection helps to detect enrolled face or uploaded license, or uploaded car details are scanned by Face or image detection process.

Drawbacks / Limitation of the thesis

For many of the parties involved, using the parking management system provides several benefits. However, it does have certain drawbacks. Some people have been unwilling to use the parking management system because of these disadvantages. These disadvantages, however, can be overcome at any time.

The high cost of contribution or installation: The parking management system is beneficial to many parties. However, there are several drawbacks to this approach. Some customers have been hesitant to adopt the parking management system because of these drawbacks. These drawbacks, though, aren't insurmountable.

Regular Maintenance: Although the system is automated, it nevertheless requires business maintenance on a regular basis. This is to confirm that the system is in excellent functioning order and that no errors have occurred. Maintenance might be done once every several months.

Operation: The parking management system is foreign to many people. As a result, it may be difficult for them to utilize, resulting in additional parking issues

Break down: Like any other machine, the system will eventually fail. Vehicles may be unable to approach buildings and automobiles parked inside may be unable to move if this occurs. In another scenario, it might fail and cause automobiles to park in inconvenient locations.

Uncertainty in the building structure: A certain amount of building knowledge is required to operate the parking management system. The system cannot be implemented, or installation without understanding of the construction of the building might result in hazards and abnormalities.

6. CONCLUSION

Hence parking slot availability system using proteus and Arduino Uno Ide and python for effective parking slot management system by providing drivers an alert message and location and distance sharing to them and scanning the required people by face reorganization is done very successfully and implemented virtually in software without errors. Implementation of parking slot availability system using proteus and Arduino Uno ide and python ide and counting available slots in the parking area, sending SMS to the user based the registered mobile number and scanning the face or image of car based on the uploaded pics during the process is maintained and managed by GSM module, Arduino Uno, Python IDE, proteus software's are very useful in successful execution and output of the parking slot availability system and alert message to user is concluded.

This application is an initial step in reaching the effective solution for the daily concern. This project can be extended in multiple ways are to provide a central management system that make sure only authenticated information is sent to the Client, i.e., dealing with the security issues. More analysis can be done using the parking history data by which User can get recommendations or suggestions on parking spaces and their availability trends. And this analysis can be used while reserving a parking space by User or while renting a space, to decide the price of the parking space. We may also create a smartphone application that allows drivers to check the status of parking places. Implementation of parking slot availability system using proteus and Arduino Uno ide and python ide and counting available slots in the parking area, sending SMS to the user based the registered mobile number and scanning the face or image of car based on the uploaded pics during the process is maintained and managed by GSM module, Arduino Uno, Python IDE, proteus software's are very useful in successful execution and output of the parking slot availability system and alert message to user is concluded.

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