

Identify Available Parking Space Detection System using IOT

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Abstract: In college the parking slots are available but sometimes it's very complicated to find out the empty parking space and there is not any such functionality available for checking the parking slot is available. In institutes there is the separate parking available for faculties and students whenever we would like to search parking slot we have to reach there to find out the available slots. Then it is very less time consuming process to reach till empty or vacant slots. Now a day's almost all people use the smart phone so if we connect the parking slot to the smart phone then it is very useful for the upcoming vehicle to search for the empty parking slot and park the car over there. The user can also reserve the space for the parking slots via smart phone. Through this user can reserve parking space for given location online in advance. Then user can place the vehicle in the parking slot with minimal fees. After study about some current systems and it shows that the current systems are not totally automated and require a certain level of human interference and communication with the system. The difference between our system and existing systems is that we intend to make our system as less human independent by automating whole parking area.

Keywords: Smart phone, Internet of Things (IoT), IR sensor, Raspberry Pi

I. INTRODUCTION

Traffic jam caused by vehicle is an alarming problem at a global scale and it has been growing exponentially. The difficulty we encounter at these places the availability of parking space. Most of the times we need to travel to find a free space for parking. If parking slots are full and it becomes time consuming this is the biggest problem. To overcome for this situation there is a need of automatic parking system that regulates parking in given area as well as less human intervention. According to IoT techniques the system is connected with more than one device, vehicles and another items embedded with sensors, Physical world connected with computer-based systems. Our proposed system comparing with existing system the efficiency is improve, economic profits, and reduced human efforts. IoT is the only way to get proposed for the identification of empty parking lot the proposed will connect the parking using IoT to android. An automatic parking system that provides the parking slot at any time to user. In registration module, user can register with the help of registration process and user can login. There are many problem occurs in current system, but with help of this proposed system user can reserve the parking lot by using Android application.

So that, proposed system designed a new parking reservation system that would solve the need of exploring entire parking slot and would also solve low utilization level of conventional reservation-based parking slot problem. To make spaces detecting easy to manage and more intelligent, the ability of thinking is recommended for the detector to get the recognition results via sampling and processing sensor signals the development of reservation for parking slots commanded by android application, recognition, parking slot status and electronic billing system is implemented. This system reduces the effort and time require for searching slot. Also the payment transaction is handled online which makes the system less human dependent.

At the time of checkout the user has to pay bill and extra charges if any then only barrier will get opened. There are three modules (1) Android Application (2) Interfacing of Microcontroller with sensors (3) Interfacing of Microcontroller with rotator motor. This system is useful for users, whenever user want to parked the vehicle according to the user's need at that time user can reserve their own slot.

II. LITERATURE SURVEY

The author [1] has been proposed the system that is to automate the car and car parking as well. A model of an automatic car parking system that can identify the number of car parked in parking area at any given time on the availability of parking slot. The entering and leaving to the slot is depend on the android application.



A system based on smart phone payment for parking spaces has been described by author [2]. The smart phone reports when it makes the payment and the application also reports when the user returns to the parking location and then drives away.

The method based on wireless sensor given by Vamsee K. Bodaetal. This method having low cost and by using the wireless sensor at the places like the entrance and exit positions of the parking lot. The total number of cars in the parking area can be determined by the difference of incoming and outgoing cars [3].

The author[4] describe that parking is easier by using context information of a smart city , The system defines the parking status which are Available parking space, booked parking space etc. For wireless payment the NFC technology is used. Sensors are used for checking the presence and absence of car.

Geng and Cassandras [5] proposed a smart parking system which reserves an optimal parking space according to the driver's cost will be based on proximity to destination and parking cost.

III. METHODOLOGY

A. Existing Methodology: In Existing methodologies, there are lots of thing for smart parking system, but many author's studies to enhance the existing technology. There are several systems exists for smart parking system. Some are loop sensor-based parking detection system, ultrasonic based parking detection systems and vision-based parking detection system, this all are the existing system. . In Existing technology, there are many techniques used to improve the smart car parking system.

B. Proposed Methodology

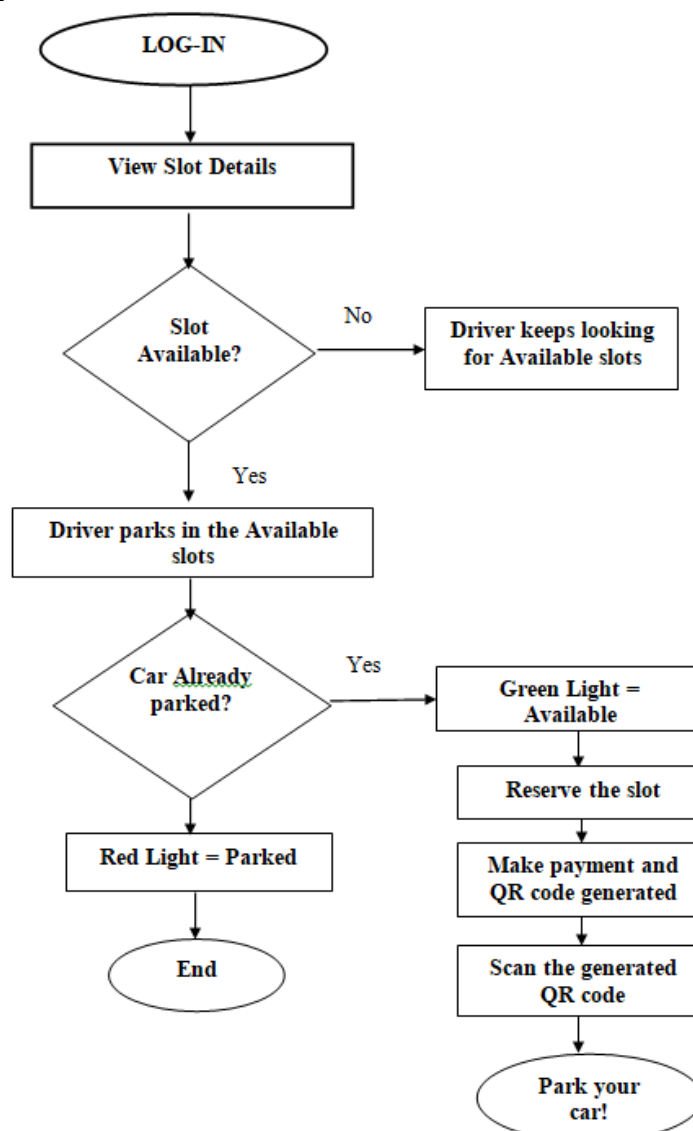


Fig.1.The overview of the proposed car parking system



Proposed system is completely based on a raspberry Pi Processor, and we developed an android application. whenever any person wants to park his vehicle in park area then have to open his application it will shows free parking slots, at that place vehicle identification is done by QR code is generated for that user, when a user park his vehicle on parking slot then IR sensor is detected and whenever he leaves that slot that time for that id payable amount is generated. As shown in the figure 1. The driver can select a slot in the parking. After selecting the slot it will generate a QR code. This generated code is scanned and the slot is reserved.

User Interface: It is the place where the user interacts with the system. The execution flow of the car parking application is further proposed in this section. The home screen as shown in figure 2 is the first screen that the user sees when they log in to the application. This screen shows all the parking lots available on the campus. Each of these parking lots has a corresponding number beside them. Indicating the number of available parking lots at that instance. The red slots are for reserved parking, the green slots indicate slots available for parking.



Figure 2: User Module

As soon as the user select the parking lot of their selection, the next page for parking slot selection is displayed in which user have to select booking type, according to that the amount will be generated after that select the time and make payment. There is QR code is generated in figure 3.



Figure 3: QR code generated

At the entrance of the parking lot the QR code is scanned and also the conformation message send after the QR code is scanned. After scanning the QR code the gate will be open which is placed before the parking slot then and then only driver will park the car.



IV. CONCLUSION

The parking problem is the biggest issue in places like theatres, shopping malls, college parking etc. Overall, our parking system is connected with another software application to help drivers to find the empty slot in parking lot more easily with less time. Also it implements most of the functionalities needed in a parking lot. Such automatic way for payment. The main functionality of the application is to show exactly which slots on various parking lots are available for park. This is achieved with the help of QR codes. The user must scan the QR code provided to them in the menu options, when they are parking. This simplifies the whole parking process. The system can further be enhanced by providing various options. In manual systems it is nearly impossible to collect the right amount from the user according to the amount of time for which he parked his vehicle. Thus by providing automation, the system can be further enhanced by providing option for billing where the collection of fee will be totally based on the time for which the user parks his vehicle. The system can be further enhanced by providing options for payment of bill by various modes such as credit card etc. We can add a GPS module to store the location for every unit.

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