Car Park Access Control System

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Abstract – **This paper has demonstrated the idea of a programmed vehicle parking framework. Everything in the cutting-edge world is going programmed, we have fabricated a system which can consequently detect the vacant parking spaces through the entryway and after that show the number of vehicles in the parking lot. This computerized vehicle parking system lessens the time taken to check the space for vehicles by showing the accessible spaces for parking on an LCD display at the entry and exit. Using OpenCV we can detect the empty slot for parking. OCR reader is used for user registration by scanning the Smart ID verified and approved by the Govt. A QR code will be generated from this Smart ID and will be sent to the user for verification when he/she re-visit the parking lot.**

Keywords – **Programmed vehicle parking; LCD display; OpenCV; OCR; QR code.**

I. INTRODUCTION

Efficiency is a very important factor in IT Industry. The issue is basic – even as the quantity of vehicles has extended, parking spot in Indian urban communities has stayed steady or diminished because of a developing population. Particularly when land is constrained and costly, as in cities, parking space becomes minimal. Test this, in New York midtown region, street zone per individual stands at 33.3 sqm while in Mumbai's Null Bazaar, it is close to 1.7 sqm. This implies a vehicle in Mumbai forces a cost about 20-fold the amount of as one in New York. With the high level of vehicle proprietorship in India, leaving has become a clashing and mistaking circumstance for the individuals. Regardless of whether at an air terminal, bus stop and Malls, issues with parking slot are common. Absence of open parking can hurt neighborhood business the personal satisfaction for occupants. Because of poor parking management and policy, India struggles with chaotic situations like overcrowded footpaths, illegal parking, and criminal activities due to improper surveillance.

Let's take a look at some of the most common parking problems facing Indian metro cities today.
1. Saturated parking spaces
2. Unregulated Traffic
3. ON street vs OFF street parking
4. Cruising
5. Parking in special occasions
6. Environmental degradation

II. METHOD AND MATERIALS

In our project "Car Parking Access Control System" we have shown the concept of automation of parking system[4]. As in the modern world everything is going automatic, we have built a system which will automatically sense[1] the vacant space and display the number of vacant spaces in the parking lot. Even we can set the max capacity of cars by the help of user interface. So that there is no congestion. We are using surveillance cameras to verify and update the vacant space[4].

Using Python programing we would train the camera to the detect vacant spaces and non-vacant spaces and using embedded systems[1][2][3] we will show the result in the LCD display[1][4], to avoid the traffic for the parking lots. We have used the Anaconda Navigator (Spyder) because of its great features and it is platform independent. The library we are using for the project "Car Parking Access Control System" are OpenCV2 and NumPy, as the for the image processing for the detection of vacant space and NumPy the core library for scientific computing, which contains a powerful n- dimensional array object, provide tools for integrating C, C++ etc. It is also useful in linear algebra, random number capability etc.

Here, we are using an LCD Monitor[1][4] for the display purpose.

In our project the role of camera is very important because the camera is used for purpose of vacant detection and also as a security purpose. Nowadays, security has become a big issue. So, thing in mind about this issue we are using a surveillance camera which does both the work scanning for vacant slots as well as security purpose.

For the security purpose around the parking area have come up with a propose which is the second module of our project using OCR[5][6] which is used to convert the scanned documents into text form for the security purpose. This text form is then converted into a QR code[8][9]. We are using QR code[8][9] instead of Barcode because QR codes[8][9] can hold far, far more data as compared to barcode and QR codes[8][9] can trigger several different types of actions, such as send a tweet, dial a phone number, bookmark a website, download a Card, Also, QR codes[8][9] can be modified with up to a 30% loss ratio. We will store the scanned text from the OCR[5][6] into the QR code[8][9] and is then send

to the customer which further used during the exit. We are developing an all in one app which can do all this work using a cell phone.

III. IMPLEMENTATION

1. The customer checks in the display outside the parking area whether there is vacant lot[1][6] in the parking area. If there he/she will go inside the parking area.
2. After entering the parking area, the guard will ask for documents like driving license[7] for registration purpose.
3. A QR code[8][9] is sent to the customers WhatsApp no. and then the customers are assigned with a vacant slot.
4. During exit the customer should show the QR code[8][9] to the guard to verify at the registration database.

IV. RESULT AND DISCUSSION

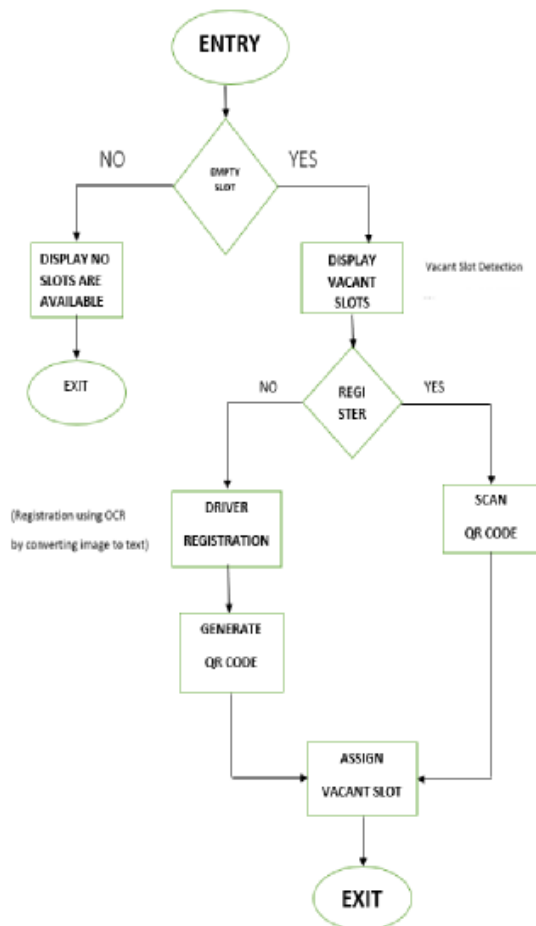Fig 4.1 shows the over view of the project using the flowchart.

Fig.4.2. Vaccant space display.

Fig 4.2 shows how the surveillance camera detects the vacant space.

Fig. 4.3. Image to text using OCR.

Fig 4.3 shows the scanned document into text form for registration. Reduces the time taken to check the space to be used by displaying the spot where the space for parking is available on an LCD display.

Fig. 4.1.Flowchart of proposed algorithm.

Fig.4.4. Text to QR code

Fig 4.4 shows that the output of OCR textual formis converted into QR code.

V.CONCLUSION

To develop an intelligent, user friendly car parking system which reduces the man power and traffic congestion and safe and secure parking slots within limited area.

The system can be used at all places starting from domestic to the industrial sectors. The simplicity in the usage of circuit helps it to be used by a large number of people, because people with less knowledge of hardware can also use it without facing any problem. This Automated car parking system the parking of vehicles and thus reduces the time taken to check the space to be used by displaying the spot where the space for parking is available on an LCD display.

VI. FUTURE WORK

One thing which can be implemented in large scale is to assemble all advanced parking in single app/platform. For example, a city where hundreds of this type of parking are available. All parking can assemble and connects the available slot or current status of all parking into the computer. Android app can be developed which uses the current location of the user and show the nearby parking places where parking slot is available.

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