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Smart Car Parking System

Mithun Mhatre[1], Priyanka Kamble[2], Raheel Kumar[3], Qais Nadkar[4]

Head of Department, Computer Technology, Bharti Vidyapeeth, Kharghar, India[1]

Professor, Computer Technology, Bharti Vidyapeeth, Kharghar, India[2]

Student, Computer Technology, Bharti Vidyapeeth, Kharghar, India [3,4]

Abstract: This paper introduces a new method to increase the efficiency of the current Parking System. This paper recommends a new strategy to find a parking space near our desired destination. This system also suggests a different parking lot to the riders is the current parking lot is already full or is booked. The suggested parking lot that is the next nearest parking lot to the desired destination. This System works globally as it is connected with the internet.

Keywords: Smart Car Parking System, destination, global, internet.

I. INTRODUCTION

An Intelligent Car Parking System is created for the development of traffic management system. It increases the efficiency of parking cars. At present, the common method of finding a parking space is manual where the driver usually finds a space through luck and experience. This process can take lots of time and effort and may lead to the worst case of failing to find any parking space.it can be a worst scenario if a driver is driving a heavy vehicle. The alternative is to find a predefined car park with high capacity. After all, this is not an optimal solution because the car park could be far from the user destination. This project aimed to provide information about nearby parking spaces for the driver using supported devices such as smartphones or tablet PCs. In this, we will use IR sensor for the detection of the car in a parking bay. When the car is parked it will get detected by the sensor and the data will be sent to the processor and then transmitted over the internet to connected devices. This project aims to reduce the use of manpower and to provide safe and secure parking slots for the drivers.

II. RELATED WORK

To help manage cars in parking area to avoid congestion and arrange cars in an allocated position Car Parking system is used. This system tracks how many cars pass through the gate and for how long each of them are parked, then the system can calculate the amount of money the driver of the car has to pay for parking the car. This system is used in busy and congested public areas where there are a lot of public meeting points and a lot of vehicles arrive daily which need parking space. Example if there is a cricket stadium in an area then on match days the area would be filled with a lot of people who have come to watch the game. If there is no system that organizes the public cars in a organized manner then it may create chaos.

Types of Car Parking System:

- **Wired Sensor Based:** Wired sensor based system is a system that uses sensors like ultrasonic sensors to detect the presence of vehicles in a parking lot. The sensors in wired based systems are connected to a centralized control unit that stores and manages the parking occupancy information. This information then sent to the mobile devices that are used by the user or the display devices in the car park. The display devices provide directions to the drivers or riders so that they can reach the parking lot.

- **Wireless Sensor Based:** With changing times there is also changes in the methods that are used to connect the devices around the world in last decade the wireless technology is being employed by many of the companies who develop the computing products because they are simple small and create less chaos. The parking field also has employed the wireless methods. In a wireless car parking system, the sensor nodes are deployed in each parking lot. The sensor module is equipped with the light, temperature and sound sensors. This module relays the data to the main module using the Wi-Fi signal. The only disadvantage of the wireless technology is that it is more costly that the other methods.

- **Counter Based:** The last method for Smart car parking system is to use a Counter Based system which uses sensors to count the number of vehicles entering and exiting the car parking area. The sensor on the gate detects the presence of the car and opens the gate as the car enters the parking lot the counter decreases the count on the display which shows the number of vacant parking spaces in the parking lot. It's the same but

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opposite for vehicles exiting the parking lot. This system is cheap but it does not guide the drivers to the parking lot.

General Features of Smart Parking System:

- Enable the driver to collect ticket upon entrance: car Parking system should be able to allow the driver to get his ticket after he press the button of the gate barrier.
- The system should record the entire cars that pass through the entrance.
- The system should allow the gate to open whenever a driver has press the button and take his ticket.
- Allow the drivers to make payment: if it's of commercial use, the system should enable the drivers to make payment of their charges before exiting.
- Allow the driver to exit: if the driver has paid his charges and require exiting, the system should open the gate to allow him exiting.

III. AIM AND OBJECTIVE

The vison of Smart Car Parking System is that it will have following properties:

- **Intelligent:** One of the best point of this system is that it is based on IoT so it is a intelligent system that is capable of automatic detection of the empty parking lots.
- **Efficiency:** Since this system is connected to internet and includes some reasonable processing power it is automatically able to update itself thus making it more efficient that the traditional systems,
- **Accommodating:** With the development of the automatic and AI enabled cars it is important that the parking spaces should be digitalized as wells so that it can be compatible with the upcoming system.
- **Motivating:** As parking is the everyday need of most people in the world this system will be of key interest of various business organization as this project can be commercialized and can generate a good amount of revenue.
- **Eco Friendly:** As this system decreases the time and travelling required to look for parking it also helps in reducing the amount of fuel spent by the riders in the process looking for parking.

IV. EXISTING SYSTEM

Since the old days the people of this world are using the same method to find a suitable parking space for their vehicles. Yes, the elite status group of people who are very rich are able to afford their own parking spaces and everywhere they go they get a reserved parking space for themselves but this world is not only filled with rich people there are people from every financial background and not everyone is able to afford a reserved private parking space. So to end this stereotype and to provide the financially challenged people a way to have a better method of parking their vehicle we proposed a new kind of system that allows every individual to have a good enough temporary parking space at reasonable parking place. The old system also involves a lot of luck to get parking space which is not good enough and involves a huge amount of waste of fuel.

V. PROBLEM STATEMENT AND SCOPE

Transportation is an important part of every one's life now a days and it is mostly concentrated on cities and towns due to presence of public areas like malls, parks, cinema halls and other entertainment locations and parking is an very important part of transportation every person has to park their car somewhere to visit the places. Both transportation and parking are gaining a traction for key priorities as the population metropolitan areas keeps increasing and with the increase in population comes the problem of finding a place the vehicles of every citizen in the cities. Due to increase in the population the amount of space that is required by the people is also increasing thus leaving us with less space to live and to parkour vehicles. So it is very important that there should be certain regulation in the field of parking. It has been found that the fuel wastage due to transportation and parking is increasing to alarming levels. No commercial organization or business organization has looked into commercializing the parking spaces that are available to people yes free parking is good for people's budgets but it is not organized this leading to increase in fuel waste and the it also increases traffic in developing countries like India ad people tend to park their cars at roadsides leaving less space of driving for people who are using those roads often leading to high amount of traffic.

VI. PROPOSED SYSTEM

The system is derived from the idea of IoT. The system uses the Arduino consisting of RFID technology to monitor car parks. An RFID sensor calculate the number of parking spaces that are free for parking the available parking lots. The use of RFID facilitates implementation of a large-scale system at low cost. This system provides a way to reduce or

eliminate disputes in the parking lots and helps minimize the time required in looking for a parking space. After logging into the system, the user can choose a suitable parking space. Information on the selected parking location will be confirmed to the user via notification. Then, the system updates the status of the parking space to "pending" during which time the system will not allow other users to reserve it. If after a certain period of pending time the system determines that no car is parked in that space, then it changes the status to "available". The system will update the status from the server (the status of car park spaces) when a new car joins in the system. Therefore, the status of all the parking bays is always accurate and updated in real time. The system will help plot the parking time for each parking space in real time and can support the business with hourly parking charges.

VII. METHODOLOGY

(1) In Smart Parking System the process starts when the user wants to park his/her car in a parking lot.
(2) The user checks the parking app in his/her mobile phone to check for the parking space available in the nearby vicinity of the user.
(3) The app shows the nearest parking lot which can be used to park the car. If the user finds the parking lot favourable then he can select the parking lot.
(4) Upon selecting the parking app will guide the user to the parking lot. The user can enter the parking lot and go inside to park his/her car in the right spot.
(5) When the user wants to exit the parking lot the user goes near the parking gate and swipes his/her card and if the card has enough money the gate opens and the transaction gets completed.

VIII. FUTURE SCOPE

In future, this system can be improved by adding other applications such as online booking by using GSM. The driver or user can book their parking lot at home or on the way to the shopping mall. This can reduce the time of the user to searching the vacant parking lot. Integrating this system with some powerful computational hardware and better sensors could help increase the efficiency of the system. Synchronizing the parking spaces in a larger area for better functioning of the system.

IX. CONCLUSION

Times are changing and even the manual technique for car parking has to change and seeing a change in mind set of every individual this technology would also be taken whole heartedly and we would see that car parking won't be that time consuming and much accurate and preferred across the globe wherever there would be a parking slot. And as described above the merits of this smart parking system we think that it's not that far enough when we would see this technology being used in India and in terms benefiting the whole society as well as the company who is involved in pay and park system. Analysis of the model has to be done while developing a life size model. The mechanical model has been designed and the software as well as the control circuit has been implemented successfully. It demonstrates the working of the planned automated smart parking system. The main advantages are space optimization, cost effectiveness and security. So we can conclude from the above reports that the Smart Car Parking System can be a blessing for our world if we pay enough attention to it and start development in this sector as well. With the development of the automated cars in the future this system would become a necessity for every citizen. So we should pre-emptively do certain amount of development in this sector to make the future developments easy.

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