Parking Hippo

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Abstract:-In this study, we have designed a Smart Car Parking System which makes it easy for the user to book a parking space. Due to the rapid increase in vehicle density especially during the peak hours of the day, it is difficult for the users to find a parking space to park their vehicles. This study mainly focuses on reducing the time in finding the parking slots and it avoids the unnecessary travelling. Thus, the waiting time of the user is minimized.

Keywords:- *ESP8266, IR sensor, Wi-Fi Protocols, PIC 18F4520*

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I. INTRODUCTION

In the development of traffic management systems, a smart parking system was created to reduce the cost of hiring people and for optimal use of resources for car-park area owners. Currently, the common method of finding a parking space is manual where the driver usually has to go and find a space in the street through luck and previous experience. This process takes time and effort and may lead to the worst case of failing to find any park space if the driver is driving in a city with high vehicle density.

The alternative is to find a predefined car park with high capacity. However, this is not an optimal solution because the car park could usually be far away from the user destination.

This study aimed to provide information about nearby parking spaces for the driver and to make a booking to prior minutes earlier using supported devices such as Smartphone. Furthermore, the services use the ID of each vehicle in booking a parking space. The experiment results show that the proposed booking-based parking policy has the potential to simplify the operations of parking systems, as well as alleviate traffic congestion caused by parking searching.

II. ARCHITECHTURE

A. System Overview

The system is derived from the idea of Wi-Fi and IR sensor, we propose a smart parking system detecting and finding the parked location of a consumer's vehicle. Using ultrasonic and magnetic sensor, the proposedSystem detects vehicles in indoor and outdoor parking fields, accurately.

The above application is about to book the parking space in such places where finding parking space is not an easy job. It is used to reserve the parking spot for vehicles before arriving there, which will eliminate or reduce thehustle caused while parking. The system keeps the information about parking in database by tracking every allotment of parking in specific area. The user first registers and create his account through which user login and find the space to be reserved and pay the amount for booking parking space. After booking the parking space user gets a transaction number which will be displayed on the admin page. If the transaction number matches, allows user to park. Therefore, the status of the overall parking system is always 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.

B. System Architecture:-

i. User End

- GUI (Graphical User Interface) :-
  It is an interface, which interacts with users to obtain their basic information and the parking spaces, which they book for themselves. Results are shown over this module.
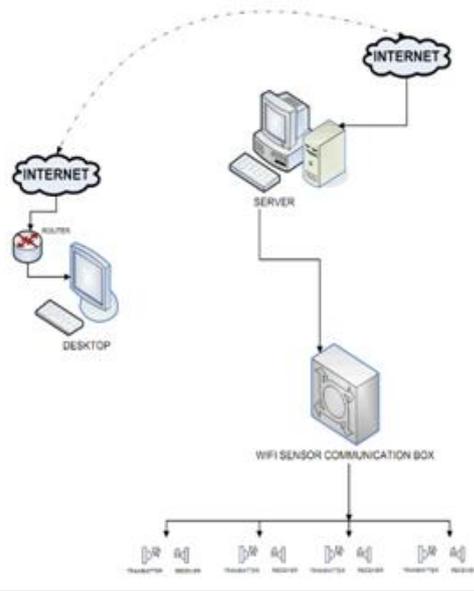
Fig. 1. Block Diagram of Parking Hippo

ii. Server End

- Wi-Fi Protocol:-
  - ➢ UMA compliant and certified
  - ➢ Antenna diversity and selection (software managed hardware)
  - ➢ Configurable packet traffic arbitration (PTA) with dedicated slave processor based design provides flexible and exact timing Bluetooth co-existence support for a wide range of Bluetooth Chip vendor.
  - ➢ Dual and single antenna Bluetooth co-existence support with optional simultaneous receive (Wi-Fi/Bluetooth) capability.

- ESP8266 :-

  Espresso's ESP8266EX delivers highly integrated Wi-Fi SoC (System on Chip) solution to meet users 'Continuous demands for efficient power usage, compact design and reliable performance in the Internet of Things industry. With the complete and self-contained Wi-Fi networking capabilities, ESP8266EX can perform either as a standalone application or as the slave to a host MCU. When ESP8266EX hosts the application, it promptly boots up from the flash.

- IR(Infrared Sensor) :-

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor.

III. IMPLEMENTATION AND TESTING

Probabilities Table Of Parking Slot Positions				
Slot status	Database Entry		Sensor Data (Slots Availability)	Slot Color
	Booking Remark	Parking Remark		
Available	Not book	Not Park	Available	Light Green
Available but Unauthorized access	Not book	Not Park	Unavailable	Dark Green
Unavailable Not Reached and Unauthorized access	Book	Not Park	Unavailable	Pink
Unavailable Not Reached	Book	Not Park	Unavailable	Yellow
Unavailable Reached	Book	Park	Unavailable	Red

Fig.2. Implementation & Testing

1. **Light Green:** Slots are available and user can book this slot. Here the booking remark and parking remark are not book and not park.
2. **Dark Green**: Slots are unavailable but their is unauthorized access. Here the booking remark and parking remark are not book and not park.
3. **Pink**: Slots are unavailable and the user has not reached and unauthorized access .Here the booking remark and parking remark are book and not park.
4. **Yellow**: Slots are Unavailable and the user has not reached .Here the booking remark and parking remark are book and not park.
5. **Red:** Slots are unavailable and the user has reached. Here the booking remark and parking remark are book and park.

IV. FEATURES

1. Photo detector and preamplifier in one package.
2. Internal filter for PCM frequency.
3. Improved shielding against electrical field disturbance.
4. TTL and CMOS compatibility.
5. Output active low.
6. Low power consumption.
7. High immunity against ambient light.

8. Continuous data transmission possible (1200 bit/s).
9. Suitable burst length ≥10 cycles/burst.

V. ADVANTAGES

1. There is a greater sense of security due to the fact that patrons do not actually walk to and from their own space.
2. It is highly feasible for extremely small sites that are unable to accommodate a conventional ramped parking structure.
3. There is high parking efficiency
4. There is no need for driving while looking for an available space.
5. There is a minimal staff requirement if known parkers use it.

VI. CONCLUSION

The development of a new prototype of Smart Parking System based on Reservation to optimize parking management. In this system, we implement parking reservation policy to balance the benefit of service providers and requirements from the users. Moreover, we have presented the detailed design, implementation and evaluation of the prototype. Based on the obtained results from our simulation study, we conclude that the proposed reservation-based smart parking system can alleviate traffic congestion caused parking searching and reduce the amount of traffic volume searching for parking.

VII. ACKNOWLEDGEMENT

VIII. REFERENCE

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198