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## Personal Assistant to Reserve Car-Spot

P.A.R.C.

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**Abstract** — *In today's world the usage of personal vehicles is increasing rapidly. Many people prefer personal vehicles rather than the public transportation. It seems very difficult and frustrating as well to find parking space in many metropolitan areas, specially during the rush hours. It is often very difficult and also costly in every major city of the world to find a proper and secure parking space. This results in a need to provide sufficient places for parking which helps the user to reserve the parking space for his car for specified time period safely. The project aims to propose an android based smart parking system where the android application used by the end user is connected to the mini hardware model by the use of Raspberry Pi2 and sending signals to the hardware model to indicate reservation of slots.*

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**Keywords-** *Internet of things(IOT), Smart Parking System, Raspberry pi, Raspbian OS, Android application, Parking slot, Sensors.*

### INTRODUCTION

In today's parking lots there is no standard system to check for availability of parking spaces. The current system mostly relies on human interaction with the physical world and entity. This leads to wastage of human power and time. These parking lots are dependent on Human-to Human Interaction (HHI) which is not much efficient. Many times when people go to malls and commercial complexes, they experience that there is a limited space for parking especially during the prime hours. Hence, there is an immense need for a robust parking system that will enable us to reserve the parking spots. For this it's necessary to build a centralized system to gather all the information of parking spots of malls, and other commercial complexes car parking systems. Smart Parking systems typically deals with reserving the car spot in a desirable commercial complex for predefined period of time. It involves using low-cost sensors, real-time data collection, and mobile-phone-enabled automated payment systems that allow users to reserve parking spot in advance for specific amount of predefined time. This implies the use of mobile-to-mobile technologies which aims at rightness/safety as well as convenience of user.

### PROBLEM STATEMENT

To create a system for reserving parking space by android application using Raspberry pi as an application server.

### RELATED WORK

Various methods have been used for development of intelligent parking systems. Many of the existing systems require little or more human intervention for the functioning. One of the intelligent systems for car -parking has been proposed by using Image processing. The main idea behind this project is to help the user analyze areas where parking is available and number of slots free in that area based on the image captured by the camera. The user can pre-book a slot in the area he desires if it is available some hours prior to his expected arrival. This will help reduce the load on the administrator drastically. The user can search the parking slot through Android Application and pre-book the slot for the desired time period.

### OBJECTIVE

The main objective of this system is providing a simple android application for reserving the parking spots for cars. It also optimizes the Parking Space Usage. Booking of parking slot can be done in advance for desired time. The system also provides the feature of Cancelling and extending the booking.

## **LITERATURE SURVEY**

Thanh Nam Pham [1] This paper introduces an algorithm to increase the efficiency of the current smart-parking system and develops a network architecture which is based on the technology of internet-of-things. This study has proposed a system that helps users to automatically find a free parking space with minimum efforts.

Yash Jain [2] This paper discusses about the problem of car parking which is growing in urban areas due to the growth in population. The number of vehicles have increased simultaneously due to the growth of population and because of the limited parking lots, the problem of car parking is increasing. To reduce this problem, a system is designed to provide a full proof based on growing urbanization, increasing traffic flow and technology growth for implementing new and useful help and services to the transport system with aim to increase the local social wealth by making use of a mobile phone application scanning and searching for a vacant parking area at real time and to track the vacancy in the parking lot by making use of existing technologies.

Prof. Gayatri Bhandari [3] In metropolitan cities, it's very difficult to find a vacant parking slot. Users also have no knowledge about the available parking slots in the required area. This paper proposes a Smart parking system. This system consists of a central server, which contains information about the reserved and vacant parking slots. This system proposes a safe and secure parking of the cars which works on sensor communication and secured wireless network. This central server also maintains the count of the available slots and informs the user about it.

Prof. D. J. Bonde [4] This paper aims at proposing a design of an automated car parking system by the use of an android application. This application controls the number of cars parked or unparked in a confined parking area by the use of an efficient algorithm and the requests made through the application.

Ms. Archana [5] Internet-Of-Things deploys large number of different end systems. It is also known as machine to machine, machine to infrastructure, machine to environment, internet of intelligent things, intelligent systems. IOT is the network of physical objects which can be accessed through the use of internet. Open and easy access is provided for the development of digital services to the selected data. It is a complex task for internet of things to build a general architecture as it includes large variety of devices, link layer technologies and services. The main focus here is on urban IOT system and level of decreasing light pollution, electric energy waste and vision of improvements in monitoring the vehicles in parking lots.

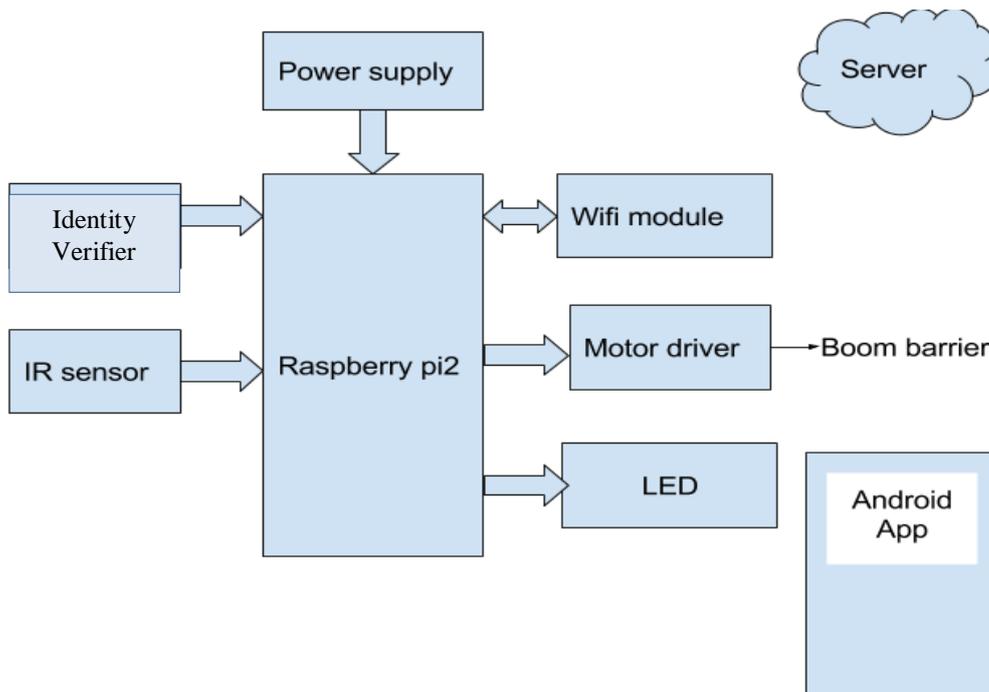
Mr. Basavaraju S R [6] This paper proposes a study of design of Smart Parking System (SPS) that enables the user for finding the parking area which is nearest and which gives the availability of parking slots in that desired parking area. It mainly focuses on reduction in time for finding the parking lots and also avoiding the travelling which is unnecessary through filled parking lots in a particular parking area. This results in reduction of the fuel consumption which in turn results in reduction of carbon footprints in an atmosphere. This paper proposes a study of a system design which is a Raspberry pi based parking sensor containing pi-camera for detecting the empty spaces of parking and sends this data to server, and this stored data is accessed by the users. This system thus enhances the user ability for checking the status/availability of parking spaces before setting their journey.

Zhanlin Ji [7] This paper represents studying of the concept using cloud-based intelligent car parking services in smart cities, as an important application deployed on the Internet of Things (IoT). The IoT sub-system includes sensor layer, communication layer, and application layer. A high-level view of the system architecture is obtained. For demonstrating the provision of car parking services with the proposed platform, a cloud-based intelligent car parking system for use within a University campus is described along with details of its design and implementation.

## IMPLEMENTATION

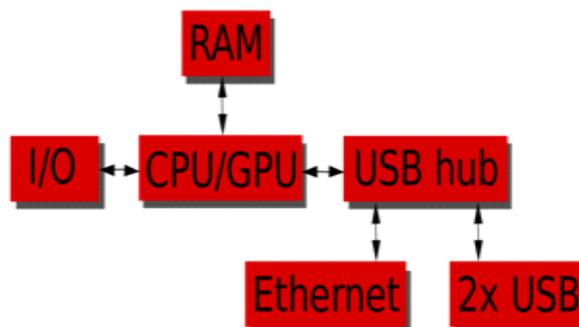
### Block Diagram & Explanation

The user can reserve the parking slot in advance for the desired amount of time through his android application. The system consists of three modules viz., Android application, Raspberry Pi and a mini hardware model of the parking slot. The Raspberry Pi will be used as an interface between the user and the hardware model. The android application of user will be connected through wireless network with the Raspberry pi which in turn will be connected to the hardware model through the wired interface. The system will also consist of IR sensors for detection of car on parking slot. The user will first have to make a reserving request through his application. This request will then be sent to Raspberry Pi which will apply algorithm and see if the requested parking slot is available or not. If available the user will be informed his slot through notification. This system also provides the feature of automated payment which results in reduction of manual work to a great extent.



### Architecture of P.A.R.C

#### Raspberry Pi :



## CONCLUSION

An efficient Car Parking Reservation Application is proposed which will majorly reduce the parking problem. It shows how the parking problem at crowded places can be handled in an organized manner. It helps the clients in finding out the availability of a parking slot, get the availability confirmed, and reach the place within the time slot allotted and also make the online payment. It also makes the management easier from the side of administrator. It also saves the time of users required for searching a parking slot. The components used for the implementation of the system provides efficient output at various stages of implementation of the system. The interfaces established between various components provide an effective way of communication across the overall working of the system. Thus, the system functioning is efficient and is recommended for commercial implementation.

## FUTURE SCOPE

The future scope of this model can be the use of number plate recognition system to authenticate the user. Deployment of this system on larger area in public places can help common people park their vehicles efficiently without having to wander searching for the parking places at prime hours of the day.

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