



# Automated Parking System using IOT

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## Abstract:

In today's world, majority of people travel by vehicles, the cities have reached their full occupancy. So most of the time people spend their precious time in searching for parking lots. Using automated smart parking system we can reduce the time and also human efforts. Our system is based on Internet of things (IOT). IOT is a concept used to connect all our surrounding things to a network and communicating with each other. It is broadly classified into three categories sensing, processing and connectivity. Our system is cloud based system which contains Optical sensor to detect empty parking slots and send this data to server, this data can be accessed by the users.

**Keywords:** Internet of Things (IoT), Optical Sensor.

## 1. INTRODUCTION

In this system, we propose to use one optical sensor per parking space. This optical sensor (Phototransistor), depending upon the ambient light will help in determining whether the parking space is vacant. The same will be displayed over the web which can be directly accessed by the users from the cars itself. This display of information is done by implementing the concept of Internet of Things. IoT is a concept used to connect all our surrounding things to a network and communicating with each other. It is broadly classified into three categories sensing, processing and connectivity. The Internet of things is the internet work of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings and other items like embedded with electronics, software, sensors, actuators, and network connectivity, that enable these objects to collect and exchange data.

### 1.1 Problem Statement:

To design and implement the system that will aid the driver to have immediate knowledge of the vacant parking spots in his vicinity, by displaying the information over the web.

### 1.2 Objectives:

1. To reduce the amount of unnecessary time spent by car users on a daily basis by providing a smart parking system.
  2. To create a user-friendly and adaptable system to be implemented in parking garages.
  3. To reduce traffic blocks that occur in parking lots.
- This designed automatic parking system reduces the risk of finding the parking slots in any parking area and also it eliminates unnecessary travelling of vehicles across the filled parking slots in a city. Also it provides effective solution to reduce carbon footprints in the atmosphere.

## 2. LITERATURE SURVEY

"Smart Parking System using Internet of Things (IOT)" to overcome troubles of finding vacant parking spot in nearby parking. While developing this they've used Raspberry Pi as a hardware platform and they maintained their, database on a central server. They constantly captured snaps of parking area

to determine which slots are empty and which one are occupied. [1] "ANDROID BASED SMART PARKING SYSTEM USING SLOT ALLOCATION & RESERVATIONS" in Chennai, India. Their system comprised of three sections viz., Driver request processing center, Smart parking allocation center and Parking resource management center. They employed extensive Slot allocation algorithm to assign and reserve user a slot from available parking slots. They used IR sensor to detect actual occupancy of parking slot and they tracked time for which user occupied any slot. They have also used Android platform to provide user ease to Reserve a slot. [2] "A Survey on Smart Parking System". In this they've mention many papers and research which has been conducted on Smart Parking System. They mentioned that till then most systems used ZigBee, GSM, RFID technologies to transfer data from sensors to database. Also in some cases image processing is used to determine whether slot is empty or not. [3] "Automated Parking System with Bluetooth Access". The author proposes robotic garage (RG) using Bluetooth which would be used to fully automate the placement of a car in the slot without the aid of the driver. The system automatically checks the unique registration number stored in the Bluetooth chip to check if the new vehicle needs to be parked. This system is a vertical parking arrangement for the vehicles with sensors that confirm placement of the car. Various other sensors are used to confirm that there are no passengers left in the vehicles and then the system moves the vehicle to storage area employing rack and pinion (Rap) mechanism. [4] "Automatic Parking Management System and Parking Fee Collection Based on Number Plate Recognition.", Intelligent Transport System (ITS) and Electronic toll collection (ETC) using optical character recognition (OCR) creates a record for all entering vehicle. This creates tag less entry for all vehicles in the parking lot, but it does not assign a slot to the user. A universal OCR algorithm is not available, making it difficult to create said records. [5] "Smart parking reservation system using short message services (SMS)." In today's world parking lots have become redundant and needs lot of manpower to handle and maintain it. These parking lots are not user friendly and do not provide data regarding availability of free spaces. Many researchers have contributed to this issue and formalized with various methods to better optimize the

parking lot to serve the needs. The author proposed smart parking reservation system using short message services (SMS), for that he uses Global System for Mobile. [6]

### 3. PROPOSED SYSTEM

Presence of vehicle at parking slot is determined by Optical sensors, will give output according to light incident on them. If vehicle is present then due to Shadow of vehicle output will be LOW. Whenever Vehicle is not present due to incident light output of Sensors will be HIGH. This Output is then given to Microcontroller GPIO pin. Specifications For Headers and Footers.

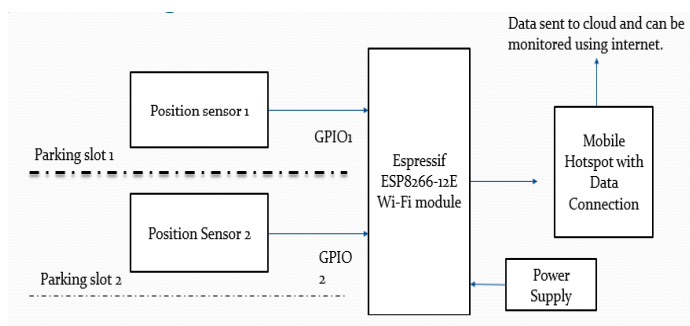


Figure.1. Block Diagram

### 4. CONCLUSION:

This designed automatic smart parking system which is simple, economic and provides effective solution to reduce carbon footprints in the atmosphere. It is well managed to access and map the status of parking slots from any remote location through web browser. Thus it reduces the risk of finding the parking slots in any parking area and also it eliminates unnecessary travelling of vehicles across the filled parking slots in a city.

### 5. REFERENCES

[1]. Mr. Basawaraju S R , “ **Smart Parking System using Internet of Things (IOT)** “.International Journal of Scientific and Research Publications, Volume 5, Issue 12, December 2015 ISSN 2250-3153.[1]

[2]. Renuka. R. and S. Dhanalakshmi , “**ANDROID BASED SMART PARKING SYSTEM USING SLOT ALLOCATION & RESERVATIONS** ”. VOL. 10, NO. 7, APRIL 2015 ISSN 1819-6608 [2]

[3]. Faiz Shaikh, Nikhil Kumar B.S., Omkar. Kulkarni, Pratik Jadhav, Saideep Bandarkar , “**A Survey on “Smart Parking System”**”. International Journal of Innovative Research in Science, Engineering and Technology Vol. 4, Issue 10, October 2015.[3]

[4]. Harmeet Singh, Chetan Anand, Vinay Kumar, Ankit Sharma, “**Automated Parking System With Bluetooth Access**”, International Journal Of Engineering And Computer Science ISSN:2319-7242,Volume 3 Issue 5, May 2014, Page No. 5773-5775.[4]

[5]. M. M. Rashid, A. Musa, M. Aatur Rahman, and N. Farahana, A. Farhana, “**Automatic Parking Management System and Parking Fee Collection Based on Number Plate Recognition.**”, International Journal of Machine

Learning and Computing, Vol. 2, No. 2, April 2012, Published 2014.[5]

[6]. Noor Hazrin Hany Mohamad Hanif, Mohd Hafiz Badiozaman, Hanita Daud, “**Smart parking reservation system using short message services (SMS).**” , IEEE 2009.[6]

[6]. L. Atzori, A. Iera, and G. Morabito, “**The Internet of things: a survey,**” Computer Networks, vol. 54, no. 15, pp. 2787-2805, 2010.[7]

[7]. Li, T.S.; Ying-Chieh, Y.; Jun-Da, W.; Ming-Ying, H.; Chih-Yang, C. “**Multifunctional intelligent autonomous parking controllers for carlike mobile robots**”. IEEE Trans. Ind. Electron. 2010, 57, 1687–1700.[8]

[8]. Faheem1, S.A. Mahmud, G.M. Khan, M. Rahman and H. Zafar, “**A Survey of Intelligent Car Parking System**”, October 2013.[9]

[9]. Keat, C.T.M.; Pradalier, C.; Laugier, C. “**Vehicle detection and car park mapping using laser scanner**”. In Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, Edmonton, AB, Canada, 2–6 August 2005; pp. 2054–2060. 9[10]

[10]. Manjusha Patil, Vasant N. Bhonge “**Wireless Sensor Network and RFID for Smart Parking System**” International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 4, April 2013.[11]

[11]. Keat, C.T.M.; Pradalier, C.; Laugier, C. “**Vehicle detection and car park mapping using laser scanner**”. In Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems, Edmonton, AB, Canada, 2–6 August 2005; pp. 2054–2060. 9[10]

[12]. Manjusha Patil, Vasant N. Bhonge “**Wireless Sensor Network and RFID for Smart Parking System**” International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 4, April 2013.[11]