



# REVIEW OF "SMART CAR PARKING SYSTEM"

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**Abstract:** As the population continues to increase it has led to the increase in the demand of car parking spaces. Smart car parking system have emerged as a promising solution to the increasing problem of parking in urban areas. IOT integrated with Smart car parking system provides real time data to optimize the use of parking spaces, which uses different technologies like sensor, algorithms, Node mcu and Arduino uno. Additionally this article discusses about the benefits of Smart car parking system including the reduced traffic congestion, increased parking efficiency and overall user experience.

**Index Terms - Smart parking, IOT, Node mcu, Arduino uno, Smart cities, Car parking.**

## I. INTRODUCTION

The growth in population has resulted in the increase in city traffic. Due to this searching a vacant space for parking the car in urban areas has become time consuming and also leads to the wastage of fuel. Drivers usually keeps searching for suitable parking space which in turn results in increasing city traffic.

The solution for this problem is the implementation of smart car parking system, which helps the driver's to find suitable parking slot. The use of Internet of Things in smart car parking system increases the overall parking efficiency of the drivers, reduces the traffic congestion in cities. As the sensors installed at the parking lot collects the real time data of available parking space, and transmits that data to the cloud server like Thingspeak that displays the information of the occupied and vacant spaces in the parking lot to the drivers. IoT sensors monitors the activity of the parking slots, the occupancy and accordingly the parking management can be optimized also providing an additional layer of security.

Driver's no more need to waste their time in the parking area in search for vacant slot as information regarding the occupied and vacant slots are displayed in an oled (Organic light emitting diodes) screen.

## II.LITERATURE SURVEY

1. C.Ajcharitavanich1 *et al.*, [1], proposed an IoT based car parking system, universities parking system and parking slots can be managed efficiently when automated. An IoT based cloud integrated parking system for smart campus. The IoT technology which monitors the availability of each parking space, and the parking slot can be booked in advance using an application. It provide the insight and a guideline into the parking systems development in smart city or universities.
2. R. Kanan, Housam Arbess [2], proposed An intelligent system based on internet of things for monitoring and Automatic billing in real time that deploys a robust outdoor vehicle localisation and recognition methodologies. A sensor system of low cost for parking occupancy monitoring in real time along and also payment without interaction of driver.
3. S. A. Ampuni, Sopater Fonataba [3], proposed automatic cashier machine in the parking system which utilize the internet of things technology, based on cloud computing, all the smart devices and also automatic machine the concept of smart parking system providing car parking spot searching and mobile application services for picking are expected.
4. Ilhan Aydin *et al.*, [4], proposed smart parking platform based on navigation as well as reservation using for smart cities with genetic optimization, the devices developed that are connected to the internet transmits data is the a source of development for smart cities design.The vacant parking lot closed to the location is found by algorithm. Traffic congestion problem majorly caused by parking issues.
5. Muftah Fraifer, Mikael Fernstro”m [5], proposed a prototype on smart car parking system utilizing closed circuit television nodes and also an computer vision detection algorithm through simulation environment. Futhermore the system demonstrates the effectuality of the design and implementation of the system.

6. Manickam Ramasamy, Sunil Govinda, Solanki [6], proposed a smart parking system based on internet of things for large parking lot to manage the parking system very efficiently for and the nearest parking slot information will be visible through application and hence reducing the traffic congestion. A cloud based system using IoT is developed to guide the user to nearest parking space.
7. Gokul krishna *et al.*, [7], proposed a smart outdoor parking system based on internet of things to reduce manpower. Most of the places in cities provide only an organized indoor parking system. Traditional parking systems are way too old and burdensome for urban cities where it is difficult to find vacant slots. A smart outdoor parking system can be designed based on IoT for an organized parking of vehicles.
8. Mahendra B M, Dr. S. Sonoli [8], proposed a smart car parking for advanced driver assistance system based on internet of things which is sensor enabled. This enables the user to pre-reserve the slot from remote location through mobile application and authentication of valid booking is incorporated to benefit valid user.
9. P. Sadhukhan *et al.*, [9], proposed an E-parking system based on IoT for smart cities. The increasing number of vehicles on road along with the mismanagement of parking lots available leads to traffic congestion. The e parking uses an integrated component called parking meter to address smart parking management throughout cities.
10. D.Vakula, Yeshwanth Krishna Koli [10], proposed a low cost smart parking system for smart cities. With the advancement of IoT the concept of smart cities can be readily achievable. IoT is addressing the most common problems faced like availability of car parking in cities and traffic jams. The system consists of an IoT module deployed on site for managing parking spaces.

### III. CONCLUSION

In the construction of smart cities, car parking facilities and traffic management have always been at the core. The car parking system integrated with the internet of things solves the problem of traffic congestion by providing real time information to the driver's related to the available parking slot. It manages time, improves efficiency and overall user experience. The literature survey provided valuable insights about the current trends and advancement in parking systems and importance as well as the advantages of using technologies like IoT. The Smart car parking system integrated with various technologies like IoT solves the problem of parking spaces in urban cities.

### REFERENCES

- [1] Chi-Hung chung, Luo-wei "vehicle license plate recognition using resolution technique", 2014 11<sup>th</sup> IEEE International conference on Advanced video and Signal Based Surveillance (AVSS).
- [2] L.V.VAIBHAV, A.Ramya, A review on smart parking Management System Using Vehicle Authentication, IJAREEIE 2016
- [3] Pahang, "Development of an Automatic Parallel Parking System for Nonholonomic Mobile Robot", International conference on Electrical, control and computer Engineering Pahang, Malaysia, June 21-22, 2011.
- [4] Mingkai Chen, "A Parking Guidance and Information System based on wireless Sensor Network," IEEE International conference on Information and Automation Shenzhen, China June 2011.
- [5] Huang cai-mei, He zhi-kun, "Design of Reverse Search Car System for Large Parking Lot Based on NFC Technology", 2014 IEEE.
- [6] Bhosale Swapnali B, Kayastha Vijay S, "feature extraction using surf algorithm for object recognition", International Journal of Technical Research and Applications.
- [7] Hirakata Y.; Nakamura, A.; Ohno, K.; Itami, M. "Navigation system using ZigBee wireless sensor network for parking", ITS
- [8] W.S.Tang, Yuan Zheng, "An Intelligent Car Park Management System based on Wireless Sensor Networks", 2009 IEEE
- [9] Giuliano Benelli, Alessandro Pozzebon, "An Automated Payment System for Car Parks Based on Near Field Communication Technology", University of Siena, Italy benelli.alessandro.pozzebon@unisi.it.
- [10] Adhirup Khanna "IoT based Smart Parking System" University of Petroleum and Energy Studies (UPES) Dehradun, Uttarakhand, 2016.