



**IJIRCCCE**

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 5, May 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 8.379**



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

# Online Parking Space Planning System

Prof. Sowmya M S<sup>1</sup>, Abhash Bajracharya<sup>2</sup>, Anshul Upadhayaya<sup>3</sup>, Digbijit Pandit<sup>4</sup>, Digdarshan Pandit<sup>5</sup>  
Asst. Professor, Dept. of I.S.E, School of Computer Science and Engineering, Jain (Deemed to be) University,  
Bangalore, India<sup>1</sup>

Student, Dept. of I.S.E, School of Computer Science and Engineering, Jain (Deemed to be) University, Bangalore,  
India<sup>2, 3, 4, 5</sup>

**ABSTRACT:** The issue of chaotic city traffic has been caused by the continuously growing population, making the search for a parking spot a time-consuming and wearisome task. Parking management organizations are therefore seeking advanced and efficient solutions to address this problem, with a high demand for parking spaces leading to increased fuel consumption. One possible solution is the deployment of a cloud-based smart parking application that allows for real-time monitoring and reservation of parking spaces. This technological innovation would improve the overall experience for end-users while reducing the workload of parking administrators. On-site deployment of the system would enable the monitoring and signalling of parking space availability, while the end-users would be able to reserve a spot through the app. The ultimate objective of the project is to grow an IOT-based smart parking system that can address the parking challenges experienced in metropolitan areas due to the high number of vehicles.

## I. INTRODUCTION

The Internet of Things (IoT) is a network of devices with attached sensors and network connection that allows devices to gather and trade information, resulting in greater efficiency, accuracy, and economic benefit. Smart parking is an example of an IoT application, which aims to address the problem of finding parking in cities. Parking guidance systems have been proposed to enhance the fundamental parking system by determining whether a car is in a parking spot, allowing users to sign up for a parking space and track the in and out the time of the vehicle for payment purposes.

## II. RELATED WORK

1. Ghulam Ali Tariq Ali, Zaid Bin Faheem, Muhammad Irfan, Maciej Sulowicz, Ryszard Mielnik, Umar Draz, Muhammad Sohail, Adam Glowacz, and Claudia Martis<sup>8</sup>

The architecture they suggest in this study seeks to forecast parking availability for the specified city parking. Their suggested approach incorporates data received from many information sources via the internet of things in addition to using a dlstm network. The Birmingham parking dataset is the primary one we used to teach our algorithm. Different performance evaluation methods were employed to reckon the availability of parking spaces at a specific moment at a parking slot to prove our model. The time used to look for an unconfined parking space will be reduced thanks to the suggested smart parking technologies. By cutting down on the amount of time spent looking for available free parking, it reduces energy consumption.

2. Amira. A. Elsonbaty and Mahmoud Shams

Smart parking is a system that utilizes mobile and web applications to give real-time data on accessible parking spaces. The structure is built on the Internet of Things (IoT) and comprises sensors and microcontrollers that are installed in every parking space. The team developed a smart parking project that utilizes IR sensors and IoT technology. The web application displays accessible parking areas, and users can select the best spot based on real-time updates. The system involves a three-step process. The first step involves sensors and Arduino devices installed in the parking lot to detect available parking spaces. The second step involves cloud services that bridge the gap between the parking lot and the user. The third step involves the user's mobile app, which communicates with the sensors via a WIFI module. The app displays the numerical data of parking spaces available, the number of vacant spaces, and the number of reserved spaces in each parking area.

3. A. Mackey, P. Spachos and K. N. Plataniotis

As cities become increasingly crowded, the need for new apps that can assist with planning and optimization has become more apparent. This study presents a smart parking system which can be used both inside and outside. The structure

utilizes Bluetooth Low Energy (BLE) beacons and particle straining to increase precision. By using simple BLE connection with cell phones, an intuitive parking system has been developed and implemented. Each location is linked with a distinct BLE beacon, giving customers with directions to available empty parking spaces and a safe, automatic payment system based on the actual use of the parking space. To assess various system components, three sets of experiments were conducted. IoT-powered sensors joined to the system manage and monitor the parking procedure, while the mobile program serves as the interface for clients and ends users, assisting with navigation, payment, reservation, and more. Park Chain, a comprehensive parking and land-use answer, is ideal for active smart city projects worldwide. This technology can be expanded to other businesses, such as real estate leasing and mortgage lending, by allowing anonymous participants to establish a trustworthy network using a blockchain that supports smart contracts. It is recommended to avoid using hard returns and only use a single return at the end of each paragraph. Text heads should not be numbered as the template will take care of that.

4.ElakyaR,Juhi Seth, Pola Ashritha, R Namith

A smart parking system is the primary remedy that lower the fuel's wastage. The answer to all of these issues that are brought up. The intelligent parking may be a method to maximize user effectiveness and efficiency while also the total cost of the fuel used to look for parking space. Data from the sensor is captured in this, and the result is attained by processing and analysis. This information is transmitted by the machines that extract the transmit pertinent information to the Arduino gadget. It provides the data to the command instruction a certain set of devices at once. The signal is sent by Arduino. The GSM module and servo motor, which additionally provides the user with notifications and guidance. Whenever a user passes into the parking space with the assigned RFID disk the reader module scans each registered user, and as a result maintaining the user privacy. Hence, it allows permits the user to learn about the parking spaces that are available as additionally, SMS alerts are sent to the client's phone number. There are three phases to it, out of which the first phase is the parking area equipped with IR sensor and Arduino devices. With the help of these devices, the user can affiliate with the parking system. The cloud services that serve as a mediator between the client and the parking space. According to the parking spaces available, the cloud is updated. The user can view the data from the cloud to assess its availability in addition to the admin, who manages it. The user side is addressed in the third section of the paper. If there is an open area, the GSM device will transmit a text message to inform the customer's mobile phone. The individual can engage with both the cloud and the parking lot concurrently. Being alerted about the lack of an essential parking area helps the user save time.

5.Abdul Ahad, Zishan Raza Khan, Syed Aqeel Ahmad

The suggested set-up uses an image-processing approach to capture and handle rounded images with the use of the Android, an image captured in a parking lot provides information on the vacant spaces for parking cars. By utilizing the pre-existing data or searching for the free parking lot through the app, the "Park Easy" app can be used on mobile devices. Users of the system can way in the data and check the if the parking spaces are available or not, and then reward them, with their mobile phones, additionally, application offers feasible alternate parking ways from every location in the town. Therefore, smart parking increases the use of current parking, resulting in higher parking revenue. Additionally, it has positive effects on the ecology and is crucial in developing eco – friendly environment. Therefore, the user might occupy data from this "Park Easy" App, will have many more owners, and is not standardized or easily accessible hence it can be turned into user friendly apps if proper time and experience is invested. Smart phones brings more positive changes such as gaining market share in the global telecommunications industry in developed and developing countries. Entrepreneurs in the software industry are able to gather data, analyses it, and provide consumers with fresh insights and information in developed countries without having to install additional hardware.

### III. HARDWARE USED

#### A. Raspberry Pi Model

The Raspberry Pi is a small and cost-effective single-board computer designed for programming education and project development. It was launched in February 2016 and has become the most popular Raspberry Pi model. The model comprises of a quad-core 1.2 GHz ARM Cortex-A53 processor and also 1GB of RAM, it comes equipped with 4 USB ports, HDMI output, Ethernet, Bluetooth, and Wi-Fi. It also includes an onboard camera and display connector for easy connectivity. The Raspberry Pi is a useful and highly popular microcontroller which has the capability of running on multiple OS, and can be used for a variety of applications, including home automation and robotics. It is widely utilized in educational projects to teach programming and electronics. The Raspberry Pi 3 is an excellent choice for anyone interested in a low-cost and user-friendly computer for learning programming and creating projects, and its versatility makes it a favorite among hobbyists, makers, and students alike.





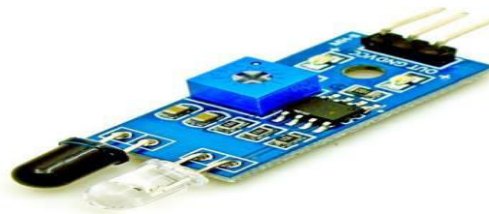
*Fig. 1 Raspberry Pi*

### B. Infrared sensor

IR sensor is an electronic device that detects and infrared rays. It is built to detect and measure infrared radiation emitted from objects. The infrared rays or radiation is basically invisible to naked human eyes, but IR sensors can detect it and convert it into an electrical signal that can be processed by a computer or other device.

IR sensors have a wide range of applications in different industries. In the security industry, IR sensors are used to detect intruders and trigger alarms. In the automotive industry, they are used to detect objects and other vehicles on the road. In industrial automation, infrared sensors can be used to find objects or materials on a production line. In environmental monitoring, they are used to detect changes in temperature, humidity, and air quality, and to identify hazardous substances in the atmosphere.

In the medical industry, IR sensors are used in medical imaging techniques such as CT scans and MRI scans to draw precise graphics of the body. IR sensors are also used in temperature sensing applications such as measuring the temperature of a person or an object.



*Fig. 2 IR Sensor*

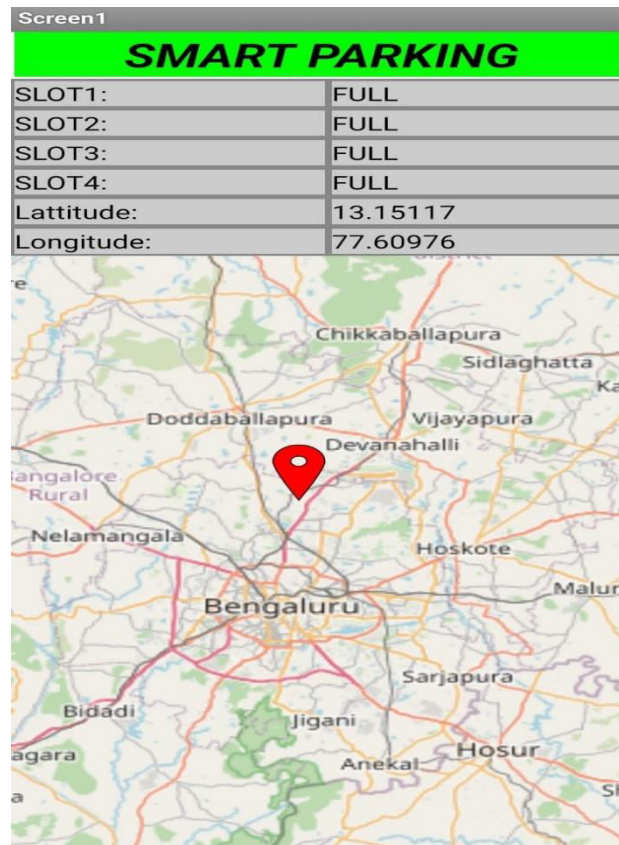
### C. GPS Module

A GPS module is an electronic device that utilizes signals received from satellites to calculate its precise location on the Earth's surface. Typically, a GPS module is made up of two main components, namely a GPS receiver and an antenna, which collaborate to capture signals from no less than four GPS satellites. The GPS receiver gauges the distance between the device and each satellite by measuring the timing of the signals transmitted by the satellites. By integrating this information with the known positions of the satellites, the receiver can determine the device's latitude, longitude, and altitude with great precision.



*Fig. 3 GPS Module*

#### IV. EXPERIMENTAL RESULTS



#### V. CONCLUSION

In the past, the concept of smart cities was perceived as impractical, but with recent advancements in technology, particularly in the Internet of Things and Cloud computing, there has been significant progress in their development. Smart parking and traffic control system has been a crucial part of smart cities. This research paper focuses on addressing the issue of parking by suggesting a cloud-based IoT solution that can provide real-time data about the parking spaces in a required locations. Using a smartphone app, users from remote locations can make reservations for parking spaces. The main objective of this research is to improve a city's parking options by making additional space or land available for parking, which can better the life of its users.



#### REFERENCES

- [1]Ali Ghulam, Tariq Ali, Muhammad Irfan, Muhammad Sohail (2020), IoT Based Smart Parking System Using Deep Long Short Memory Network
- [2]Amira. A. Elsonbaty1 ,and Mahmoud Shams2 (2020), THE SMART PARKING MANAGEMENT SYSTEM
- [3]Andrew Mackey, Petros Spachos, and Konstantinos N. Plataniotis (2020) , Smart Parking System Based on Bluetooth LowEnergy Beacons with Particle Filtering
- [4]FauziyaSayed,(2020) Smart Parking System Based on Bluetooth Low Energy Beacons With Particle Filtering
- [5]Abdul Ahad, Zishan Raza Khan, Syed Aqeel Ahmad (2016) Intelligent Parking System
- [6]D.Gayathri,SreeAnjaniKumar,PraveenKumar,“ParkingLotManagementSystem”
- [7]JaspreetKaur.”ImplementationofSmartParkingusingArtificialIntelligence”.JaspreetKaurPublished2019ComputerScience
- [8]G.K.JakirHussain,O.S.Dharshini,G.U.Kavipriya,G.Jeevanandhini.”E-reservation parking system based on IOT” March 2019, DOI:10.15680/IJIRSET.2019.0802044
- [9]Airtel, ”IoT-BasedSmartParkingSystem–AStepTowards BuildingSmartCity”





**INNO**  **SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.379**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
**INDIA**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



[www.ijircce.com](http://www.ijircce.com)

Scan to save the contact details