

# Automated Parkin System Using IoT

PRIYA DHARSHINI R<sup>1</sup>, VISALI S<sup>2</sup>

<sup>1,2</sup> UG Scholar, Department of Information Technology, Aalim Muhammed Salegh College of Engineering, Tamilnadu, India

<sup>3</sup> Associate Professor, Department of Information Technology, Aalim Muhammed Salegh College of Engineering, Tamilnadu, India

*Abstract— In the realm of modern technology, automation has become ubiquitous, revolutionizing everyday tasks. This abstract explores the synergy between Arduino and E-Token technology in the creation of an Automated Parking System. Leveraging Arduino's versatility, the system optimizes parking space utilization through real-time monitoring and allocation. Sensors and actuators seamlessly guide vehicles to available spots, enhancing efficiency and user experience. Moreover, by incorporating E-Token technology, the system ensures secure and streamlined reservation management. Each user receives a unique token containing reservation details, including date and time, facilitating hassle-free entry and effective reservation tracking. This integration epitomizes the fusion of simplicity and innovation, offering a sophisticated solution to contemporary parking challenges.*

*Index Terms- FCFS, PR, RR, DGP, LCD, IR, QR code*

## I. INTRODUCTION

The project endeavors to develop an Automated Parking System through the integration of Arduino and E-token technology. Arduino's real-time monitoring and allocation of parking space are complemented by E-token's secure reservation management. This amalgamation optimizes space utilization, elevates user experience, and offers adaptability to fluctuating demands. Additionally, it enhances security by mitigating risks of unauthorized access. Furthermore, the system contributes to environmental sustainability by reducing congestion and carbon emission, fostering an eco-friendly urban environment. Arduino's versatility empowers the system to dynamically adjust parking allocations, ensuring efficiency even during peak periods or special events. Meanwhile, E-Token technology provides users with unique tokens containing reservation details, simplifying entry and facilitating effective tracking. This fusion of simplicity and

innovation epitomizes the project's sophistication, offering a comprehensive solution to contemporary parking challenges. In summary, the integration of Arduino and E-Token technology in the Automated Parking System signifies a substantial leap in modernizing parking infrastructure. It addresses various aspects of parking management while promoting efficiency, security, and environmental consciousness. By streamlining operations and enhancing user convenience, the system sets a precedent for future developments in urban mobility and smart city initiatives.

## II. EXISTING SYSTEM

The current system employs parking cameras and image processing for real-time detection of available parking slots, facilitated by fog nodes connecting to the cloud. While this setup enables efficient processing of parking requests and real-time information dissemination, a notable drawback is the absence of information regarding the shortest path to available slots. This limitation may result in increased fuel consumption for users navigating parking lots, highlighting a potential area for improvement in user experience and environmental impact mitigation.

### 2.1 Disadvantages

The existing system will send the information from the cameras to fog nodes and it takes higher time for processing of these image.

The user will not be aware of the shortest available parking slot in the parking space and also the user will not know if there are any available parking slots in the parking space before entering.

Resources such as fuel and time are wasted in search of the parking slot. The search for the parking slot will

also lead to accidents because the user will be focused on the road while searching.

### III. PROPOSED SYSTEM

The paper advocates for the integration of IR sensors to ensure continuous processing, enabling users to register via a dedicated webpage and receive E-Tokens. An LCD display promptly communicates parking slot availability, while a servo motor facilitates gate access upon registration completion. Utilizing IR sensors, the system accurately detects vehicles for efficient slot allocation. This streamlined approach enhances user convenience by providing real-time updates and automating gate operations. By combining web-based registration, sensor-driven monitoring, and servo-controlled mechanisms, the system optimizes the parking experience while minimizing human intervention. Such integration not only improves operational efficiency but also enhances user satisfaction by offering a seamless and hassle-free parking process. The proposed system stands poised to revolutionize parking management through its innovative utilization of IR sensors and web technology, promising to address contemporary challenges in urban parking environments.

#### 3.1 Advantages

The main advantage of this paper is, the user can easily find the nearest available parking slot with the help of shortest path detection.

Resources such as fuel and time of the user can be saved. The display will display if there are any parking slots available even before the user enters the parking space.

### IV. ARCHITECTURE

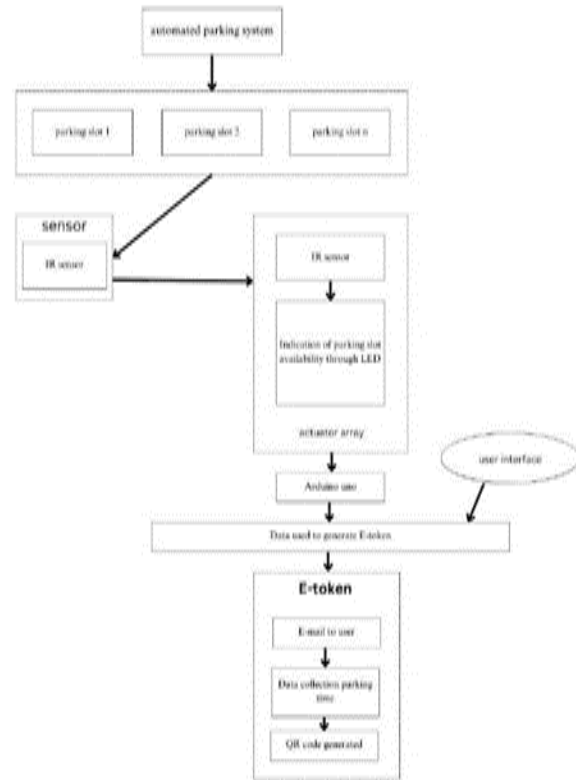


Figure -1: Architecture of automated parking system using IOT

#### Different Algorithms & Sensors used in Automated parking system

In automated parking system using IOT, the algorithms play a very vital role for giving the nearest empty parking lot, traffic management at a time of entry and exit, Load balancing at each entrance of very large and complex parking area.

There are many algorithms are used in automated parking system using IoT are:

- I.
- II. ALGORITHMS:
  - FCFS (Queue Allocation for car)
  - PR (Priority based allocation of car in queue)
  - RR (Round Robin for Load Balancing)
  - SSEA (for optimal parking lot allocation)
  - DGP (Use for finding exact location of car in space)
  - Dijkstra and ACO (finding shortest path) Etc...

**SENSORS:**

- LED
- IR Sensors

**V. RESULTS OBTAINED**

The following pictures show the result obtained for the paper and each one of the pictures are described.



Figure-2 Implementation of Automated parking system.



Figure-3 Implementation of slots in Automated parking system

**User Registration**

Name:

Vehicle Number:

Email:

Figure-4 registration page.



Figure 5- E-token for user

**CONCLUSION**

Integrating camera imagery with sensor data to rectify fog drawbacks represents a significant advancement in overcoming visibility challenges in foggy conditions. By combining the strengths of both technologies, this enhancement promises to improve safety, efficiency and reliability in a wide range of application.

**REFERENCES**

- [1] Missing Tag Identification in COTS IR Systems: Bridging the Gap between Theory and Practice (Year :2020)
- [2] Situation-Aware Authenticated Video Broadcasting Over Train-Trackside Wi-Fi Networks (Year : 2019)
- [3] Alsafery, W., Alturki, B., Reiff-Marganiec, S. and Jambi, K., 2018, April. Smart Car Parking System Solution for the Internet of Things in Smart Cities. In 2018 Ist International Conference on Computer Applications & Information Security (ICCAIS) (pp. 1-5), IEEE.
- [4] Desai, A., Upadhyaya, T., Palandoken, M., Patel, R. and Patel, U., 2017, November. Dual band optically transparent antenna for wireless applications. In 2017 IEEE Asia Pacific Microwave Conference (APMC) (pp. 960-963). IEEE.
- [5] Desai, A., Upadhyaya, T.K., Patel, R.H., Bhatt, S. and Mankodi, P., 2018. Wideband high gain fractal antenna for wireless applications.

- Progress In Electromagnetics Research, 74, pp. 125-130
- (QR-code). J. Comput. Sci. Inf. Technol, 1(1), pp.10-14. R-code). J.
- [6] Desai, A., Upadhyaya, T. and Palandoken, M., 2018. Dual band slotted transparent resonator for wireless local area network applications. Microwave and Optical Technology Letters, 60(12), pp.3034-3039.
- [7] Goyal, S., Yadav, S. and Mathuria, M., 2016, September. Exploring the concept of QR code and its benefits in the digital education system. In 2016 International Conference on Advances in Computing, Communications and Informatics (ICACCI) (pp. 1141-1147), IEEE
- [8] Idris, M.Y.1., Leng, Y.Y., Tamil, E.M., Noor, N.M. and Razak, Z., 2009. Car park system: a review of smart parking systems and its technology. Information Technology Journal, 8(2), pp.101-113
- [9] Jain, V., Sharma, A. and Subramanian, L., 2012, March. Road traffic congestion in the developing world. In Proceedings of the 2nd ACM Symposium on Computing for Development (p. 11). ACM.
- [10] Mejri, N., Ayari, M., Langar, R., Kamoun, F., Pujolle, G. and Saidane, L., 2014, June. Cooperation versus competition towards an efficient parking assignment solution. In 2014 IEEE International Conference on Communications (ICC) (pp. 2915-2920). IEEE.
- [11] Pandya, K.H. and Galiyawala, H.J., 2014. A A Survey Survey on QR Codes: in context of Research and Application, International Journal of Emerging Advanced Engineering, 4(3), pp.258-262 Journal of Technolog.
- [12] Patel, R.H., Desai, A. and Upadhyaya, T., 2015. A discussion on electrically small antenna property. Microwave and Optical Technology Letters, 57(10), pp.2386- 2388.
- [13] Tarjan, L., Šenk, I., Tegeltija, S., Stankovski, S. and Ostojic, G., 2014. A readability analysis for QR code application in a traceability system. Computers and Electronics in Agriculture, 109, pp.1-11.
- [14] Zainuddin, M., Baswaraj, D. and Riyazoddin, S.M., 2012. Generating SMS (Short Message Service) in the form of Quick Response Code