



# Review on Automatic Smart Car Parking System

Selorm Adablanu<sup>1</sup>

[selormadablanu@gmail.com](mailto:selormadablanu@gmail.com)<sup>1</sup>

<https://orcid.org/0000-0002-9424-4342><sup>1</sup>

Department of ICT Education, University of Education, Winneba, Ghana

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## **Abstract:**

The purpose of this study is to provide an automated, user-friendly, and dependable parking system. The suggested system has three operating modes: ON, OFF, and EMERGENCY. Through an IR sensor, the system was able to detect the presence of the automobiles blocking the main parking entrance. These IR sensors output data to the PLC (programmable logic controller). A worldwide trend is moving toward automatic automobile parking systems to determine precisely how much space is available for cars and to collect money as parking fees due to a scarcity of parking places and trained personnel. This new plan enhances the present auto parking system's dependability, and it can be readily put into place since it is highly cost-effective—using solar panels to provide all of its power—and the inexpensive IR sensor lowers the overall implementation cost.

This type of equipment is important to address the issue of a lack of parking space in crowded cities since it is completely automated and assigns each user a unique ID that corresponds to the trolley that is assigned to them. The proportion of Indians who own cars and motorbikes has lately grown, boosting metropolitan traffic, as a result of changing economic behavior and an improvement in living standards. In order to facilitate the transportation network and guarantee the quality of urban life, parking difficulties will present a significant obstacle. Both automated car parking systems and automated parking garage systems reduce pollution[1]. Car parking is an issue of significance both at the local and at the strategic level of planning[2]. In most major cities, it can be challenging for drivers to find a parking spot, especially during rush hour. The problem comes from not knowing where the open spots could be at that moment.

**Basic Keywords** - GSM, Microcontroller, ASIC, USART, DC Motor, Stepper Motor, Rack pinion mechanism, Simulation, PLC based.

## INTRODUCTION

An automatic smart car parking system is an innovative parking solution that uses advanced technologies to facilitate efficient and convenient parking for vehicles. Throughout these years, advancements and design changes have been made to continuously improve the automated car park[3]. The system is intended to shorten the time it takes drivers to find a parking space while also reducing the risk of traffic congestion around busy parking lots. Finding a parking place quickly, especially on weekends or public holidays, is a challenging challenge. On holidays and weekends, stadiums and retail centers are packed, resulting in limited parking space.[4] The system uses sensors and cameras to detect available parking spaces, as well as artificial intelligence to direct drivers to the closest available space. It also offers a number of other benefits, such as improved safety and security through the use of license plate recognition technology, as well as the ability to provide real-time parking occupancy data to assist with better planning and optimization. Automatic smart car parking systems are a revolutionary concept that can revolutionize the way we approach parking in the 21st century. This technology can be a great asset to cities and towns that are constantly facing the issue of parking congestion and is expected to become increasingly important in the future. With automatic smart car parking systems, cities and towns will be able to reduce congestion on roads while also providing citizens with a safe and convenient way to find parking spaces.

## PROJECT OBJECTIVE

- a) To create an automated automobile parking system that is smart, user-friendly, and decreases traffic and labor demands.
- b) To provide safe and secure parking spaces in a constrained space.

## LITERATURE SURVEY

The development of autonomous or intelligent parking systems uses a variety of techniques. These systems need some or a lot of human assistance to work, according to research. Image processing has been suggested as a component of one of the intelligent parking systems. This method uses processing to identify the vacant parking space from a brown, circular picture of the parking space, information about the parking that is currently available. The seven-segment display shows slots. A brown-rounded picture of parking spaces is initially captured. Binary images are created by segmenting the picture. This image's noise has been eliminated, and the borders of the objects have been identified. By measuring each object's size and perimeter, the image detection module can identify whether things are spherical.

The following are some papers that were referenced for the project:

"Smart Parking System with Image Processing Facility," I.J. Intelligent Systems, Applications, 2012,3, 41-47, published online April 2012 in MECS by M.O. Reza, M.F. Ismail, A. A. Rokoni, and M.A.R Sarkar[2][5][6]. This paper demonstrated Smart Parking Systems, which obtain information about available parking spaces, process it, and then position the car in a specific location. In addition, the authors have proposed an optical

character recognition technique, dubbed "ANPR-Automatic Number Plate Recognition," for car license plate recognition.

Mr. Basavaraju S. R [7] published "Automatic Smart Parking System Using Internet of Things (IOT)" in International Journal of Scientific and Research Publications, Volume 5, Issue 12, December 2015 629 ISSN 2250-3153. The author has introduced the concept of Internet of Things (IOT) in this paper, which plays an important role in connecting the surrounding environmental things to the network. The author has proposed the use of IOT categories such as sensing, processing, and data connectivity. In addition, the author presented a design for a Smart Parking System using IOT-compatible hardware such as the Arduino UNO microcontroller, which consumes less power.

Ankit Gupta, Ankit Jaiswar, Harsh Agarwal, and Chandra Shankar [8] published "Automatic Multilevel Car Parking System" in International Journal of Electrical and Electronics Research, ISSN 2348-6988 Vol. 3, issue 2, pp: (438-441), Month: April-June 2015. The authors introduced and described the concept of "automatic car parking system" in this paper, which can automatically sense the entry and exit of cars and display the number of cars on the LCD. This automated car parking system shortens the time it takes to check for available parking spaces. The authors have proposed using sensors to detect the presence of the car in this case.

## **BASIC COMPONENTS**

### **i. Relay**

Relay is used to drive the PLC's output and supply the necessary input to the geared motor. It was contactor-style work. When the PLC sends the signal to the relay driver coil, the coil is energized and we link our circuit as usually open and normally close contacts according to the requirements.

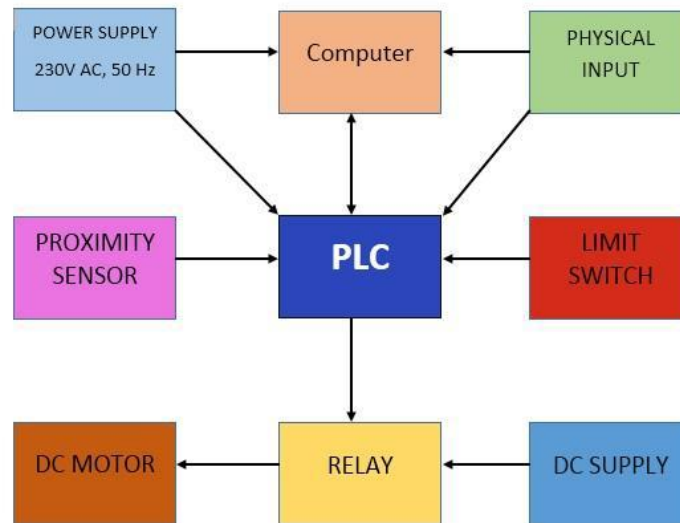
### **ii. DC Motor**

In this prototype, a high torque, low speed (30 rpm) dc motor is employed since the weight of the mechanism requires a high torque, high weight mechanism, and low speed motor. This dc motor is powered by a 24V dc source to run.

### **iii. Proximity sensor**

A proximity sensor is a sensor that has the ability to detect the presence of items around it without making physical contact. This may be accomplished by utilizing an electromagnetic field, electromagnetic radiation beam in which the presence of any item in its vicinity causes a change in the field or return signal.

Switch limit 3.4 This limit switch, which is primarily used to determine the lift's current location so that we can know where it is, determines the lift's vertical moment. It also functions as a push button.



## APPLICATION AREAS INCLUDE:

- a. public parking;
- b. airport;
- c. railroad station;
- d. hotels;
- e. shopping centers.
- f. Office building;
- g. college;
- h. apartment;
- i. big enterprises; and
- j. Car factories to keep ready autos in storage

## BENEFITS

- a. Offer sufficient parking spots.
- b. Offer parking spaces at a cheaper building cost.
- c. Save time, money and fuel[9]
- d. Less space and building volume were needed.
- e. Offers the greatest levels of security and comfort.
- f. Less human mistake occurs.
- g. Quick and efficient parking with the most flexibility
- h. Reducing traffic jam[10]

## LIMITATIONS

- a. Motor oil contaminates slots.
- b. Make it difficult for the authorities to recognize their urgent need.
- c. The estimated price is high.
- d. Regular upkeep is necessary.
- e. Offer backup systems in the event of an electricity outage

## CONCLUSION

We may thus draw the conclusion that multilevel parking allows us to park more automobiles in a less amount of space while also saving time, money, and fuel by resolving the traffic and parking issues. The system is really well-designed and simple to use. Both home and business uses of this technology are favorable. This system's components are all readily accessible on the market.

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