

# Smart Car Parking System

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**Abstract:** This paper appeals to an effective way of finding space and managing the number of vehicles by using infrared sensors to identify vehicles entering and exiting complex parking lots. This fully automatic intelligent parking system is very simple and does not require complex codes or expensive equipment. This is a simple chart designed to help solve a specific problem. This automated system helps the driver to find the empty slots in the parking area and navigate to reach the desired place effectively by reducing search time. This system is essential for large shopping malls, parking lots, data centers, and parking lots.

**Keywords:** Empty spaces, Automated, smart car parking system, IR sensor.

## I. INTRODUCTION

In this present scenario around us, we see many vehicles and the ineffectiveness to manage them in the correct order. As the population grows, the usage rate also increases, which has become a task. Finding parking spaces is a common problem all over the world. This task looks simple on the roadside and interior lanes but the actual problem arises when parking in Malls, multistorey parking structures, IT hubs, and parking facilities where several hundred cars are being parked and it becomes tedious to find a place. The general approach in finding a Parking place is to go around and drive aimlessly until a free space is found. When it comes to a large area of land on one or more floors, finding a parking space may be the easiest or most difficult task. Since the destination is unknown, the time and fuel are consumed unnecessarily. The easiest way to get close is to ensure the mobility of the parking lot, depending on your destination. The smart parking system provides us with an optical valve to indicate an empty parking space instead of driving aimlessly. The LCD outside the parking area displays the number of empty slots available. The system is convenient to access and manage the traffic congestion of vehicles, avoiding long search and waiting.

## II. LITERATURE SURVEY

The existing parking system simply gathers the available information of vacant parking lots using various sensor networks and updates the data to direct drivers. But in this, the system won't be able to direct the drivers to the parking slots. When there is no availability of parking information, blindly searching is the most common way by which drivers lookout for vacant places. The drivers keep looking for an empty parking space till the end location and won't stop looking around until they find a space.

[1] In this paper, the author put forward a smart parking reservation system using short message services (SMS). He used Global System for Mobile(GSM) with microcontrollers to enhance the security to meet the requirements.

[2] In this paper, the author put forward a method for smart parking by using a Global Positioning System(GPS) and an Android platform to show the available parking spaces. However, reservations of the slots are not applicable.

[3] In this paper, the author uses Artificial Intelligence (AI) technique to process images, which then recognizes the parking place occupied only by vehicles. The system provides images of the assigned slots, which makes the system intelligent.

[4] In this paper, the author proposed an upgraded system as above, which is deployed with the radio frequency identification (RFID) to authenticate at the gate management service (GMS) to assign a definite slot. The system provides an additional feature for monitoring the parking lot over the internet.

[5] In this paper, the Inter-integrated circuit (I2C) protocol is used along with the car parking framework(CPF) to assign the radio frequency identification (RFID) to each car which will be used to identify the car parked over a slot. Variable message screen (VMS) shows the car parked over a given floor.

[6] In this paper, the author prioritizes the cost functions and proximity to the destination to assign and reserve the parking slot. Driver request processing center (DRPC) provides an infrastructure for vehicle communication for assigning and reserving parking spaces using the smart parking allocation center (SPARC).



[7] In this paper, the author uses a wide-angle camera as the sensor which will detect only free parking spaces and records them, using these records the incoming user is assigned the parking slot.

[8] In this paper, the author uses Intelligent Transport System (ITS) and Electronic toll collection (ETC), and optical character recognition (OCR) to create records for all entering vehicles. This system allows all vehicles to enter the parking lot effortlessly, but it does not assign any slot to them. Since a universal OCR algorithm is not available, it is difficult to create records.

### III. PROPOSED WORK

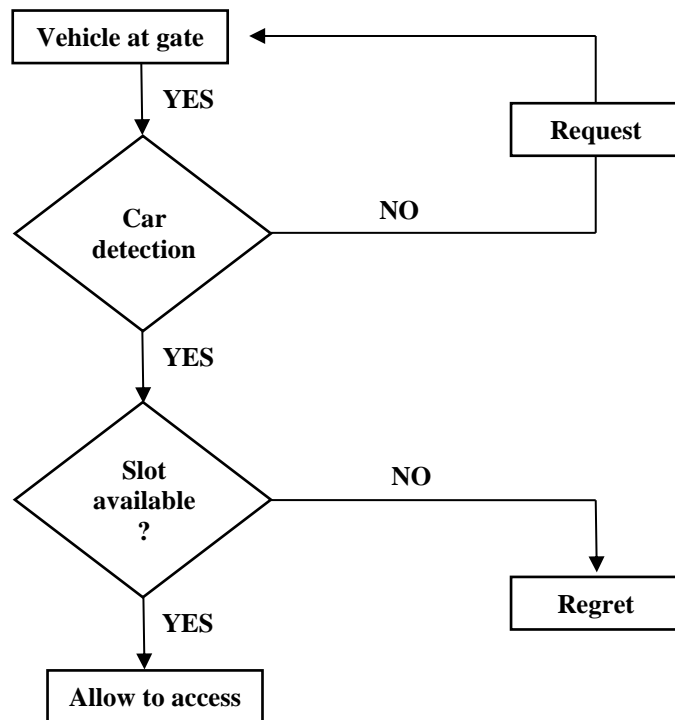
In the paper, we are focusing on Designing, Creating, and delivering effective parking innovation which can be called Smart stopping by using Arduino UNO microcontroller. Drivers can locate an empty spot easily with the help of a vehicle-stopping framework. Smart Parking system is stipulated an accurate, reliable, and cost-effective approach to make certain that street clients know precisely where empty car parking spots are available. Due to the increased population in metropolitan urban areas, the use of vehicles has also expanded immensely. It causes difficulty in stopping which gives rise to the movement clog, driver disappointment, and air contamination. The current research found that in search of a parking area a driver takes almost 8 minutes to stop his vehicle since he invests more energy. This seeking gives rise to 30 to 40% of activity blockage. This project comprehends the way to shrink the stopping issue and to try to secured stopping utilizing the perceptive stopping under the **slot allocation strategy** with the help of Arduino UNO. The main aim of the proposed frameworks is to discover the status of the stopping territory and give secured stopping. In recent years, the **Parking Guidance and Information (PGI)** framework has been developed in numerous urban areas by experts for better-stopping administration. PGI frameworks, tells about the dynamic data of stopping in the guided region and assists the clients to the empty parking spaces.

### IV. COMPONENTS AND FLOWCHART

COMPONENTS REQUIRED:

COMPONENTS	QUANTITY	SPECIFICATION
Arduino UNO	1	
LCD Display	1	16*2
Resistors	3	1k ohm,100ohm,4.7ohm
IR Sensor	2	
Servomotor SG-90	1	
Breadboard	1	
Battery	2	3.7v
Switch	1	

FLOWCHART:



## V. CONCLUSION

Automation is a step in the right direction for future fulfillment in the world of transportation. This design provides an effective solution to the above-mentioned general problems. The smart car parking system was designed, fabricated, and tested which provides Accurate threshold calibration and obstacle detection results. The design is flexible, and according to the different available spaces, it can be modified and installed even in a narrow space. Based on the number of places available the LCD displays the count of Parking spaces available. To conclude, it is possible to build an automatic smart car parking system with the understanding and correct connection of some simple electrical components. Hence the process of parking is made considerably simple by decreasing the time for aimless driving, fuel, and time.

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