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Autoguided Automobile Parking System

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Abstract*: *Finding a Parking space in a congested city like Delhi is very difficult. This is because of large number of population increasing exponentially. Due to which there is increase in numbers of cars on the roads, there is less parking space available in major cities. To reduce the parking problem we have put a smart vehicle parking automated system to solve the problem. Our paper will able to provide the not just the available parking slot in the parking space but also provide you the nearest parking slot available in the parking space. We have used IR sensors, Microcontroller and indication devices.
Keywords: Parking slots; Dynamic technology; Microcontroller, IR sensors.

I. INTRODUCTION

With increase in number of vehicles in India, it is facing a new problem i.e. lack of sufficient and automated parking space as most of the free space is utilized by the parking of vehicles, which can ultimately leads to congestion problem on the roads. Usually whenever we visit any place, our first task is to find a parking space where we can safely park our car or any other vehicle. We also notice that there is a lot of workers required at the car parking space such as one at the ticketing machine, another for guiding the vehicle owner for the free space available, 2-3 are required to take care at a particular floor of parking and one person is at exit gate who checks the parking slip before leaving and tells the total amount to be paid by the owner for number of hours he had parked their car in the parking space and if is a multi-level parking the number increases. So to run a parking space a lot number of labor is required. Not only with increase of vehicles on road, on any given working day are approximately 40% of the roads in urban India taken up for just parking the cars. In this paper we have proposed an automated vehicle parking system that requires less man-power and less number of workers at a parking space. The whole parking space is designed in such a way that a vehicle will be firstly sensed by the IR sensors and after detection at the entrance of parking space and there will be a LCD display that would indicate the vehicle owner whether there is any free space available in the parking space or not and if there is no space available the automatic motorized gates will not open. If the owner tries to enter the parking space forcefully and do not remove his vehicle from the main ate even after the LCD display has shown No space available, an alarm will start making loud noises and the security guards will be alarmed about any mishappening at the main gate.

II. LITERATURE REVIEW

With more number of vehicle increasing on the roads, illegal parking and more workers are engaging at parking space, has led to need for the development of the Smart vehicle parking automated system. For the development of such system a lot of ideas were put up.

A. Abdallah Agouz, Ahmed el Haggar, Essam Mohamed , Mohamed Emad , Mohamed Adel, Mohamed El-Sherbiny , Remon Wagdy

In this paper they have constructed the car parking system in which they employ one servo motor i.e. (Motor1) and two stepper motors including rotating system motor (Motor2, Motor3), and they have used two Ultrasonic sensors for the accurate measurement of distance and signal processing for opening the first gate and to employ the stepper motor to run and lift the car when given the command. The two stepper motors are attached at the top, which allows the prismatic movement of the care and lift the car and other to rotate the whole structure; there is one servo motor at the first gate waiting the cutting signal from the first Ultrasonic sensor. The only shortcoming of this idea is that it not cost effective and if implemented will only augment the price of the vehicle and the system is very difficult to install.

B. Janhvi Nimble, Priyanka Bhegade, Snehal Surve, Priya Chaugule

This paper aims to provide a handy, decent and automated car parking system. Due to increase in vehicles on roads, the congestion due to cars is increasing because people do not park their car properly on the roads and any space they find vacant. When a car arrives at the entrance a gate, the availability of the vacant parking slot will be checked and the driver de-boards the car. When the availability of parking space is confirmed, the car will be parked at desired slot at the user's command. The car will automatically

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trace its path to the entrance of the parking area. Here, it waits and the details for parking of car at the proper desired slot are communicated to the Car Control Unit. After receiving the information, the vehicle will further follow its path to desired parking slot. When the car is parked successfully the information will be updated on the LCD screen. The only pitfall of this system is that if implemented will increase the complexity

C. Ms. S. Kiruthika, Dr. D. Surendran.

This paper proposes a technique to experience free parking zone with Sensors. This paper is based on reservation based parking system in which it will detect an empty parking slot to which Sensors are attached. It will help the vehicle owner to choose the parking slot conveniently and it also updates the allocated position continuously. This proposed model uses a very unique technique to calculate the ideal objective car parking area. The primary stage is sensing the parking slot using the sensors; the second stage where Arduino will process the detected information; the third stage is where user will receive the parking details in their smart phones through the internet or GPS to decide the parking lot and parking system will update the target's position continuously in their system. The only con of this system is that the user requires the 24 X 7 internet connection and in some of the urban and rural areas there is no proper internet access. So this is very difficult to opt.

D. Faiz Ibrahim Shaikh, Pratik Nirnay Jadhav, Saideep Pradeep Bandarkar,Omkar Pradip Kulkarni, Nikhilkumar B. Shardoor

In this paper the composition and application with a precursor of Reservation-based Smart Parking System (RSPS) that allows vehicle driver to adequately locate and conceal an empty parking space available. This system uses cluster based algorithm which helps in repeatedly learning the parking status from the sensor based networks arranged in parking spaces, the reservation service is influenced by the change of parking status. This system is very cost efficient for multi-level parking facility using WSN (IR Sensor) and developing an android based application, by cluster based allocation method, it can also perform automatic billing process. The system monitors the availability of idle or vacant parking slots and guides the vehicle to the nearest parking slot. The main feature of this paper is the Energy consumption as it checks the system to sleep after interval of time and by minimizing their communication range. This is a very efficient car parking system that allows the driver to check parking availability and this can reduce congestions on the road.

III. PROPOSED SYSTEM

In the traditional form of parking a parking space require a lot of workers from opening the entrance gate manually, to give the parking slips manually to the driver, to guide the drivers to the vacant parking slot. We propose an automated parking system to reduce this all man-power work.

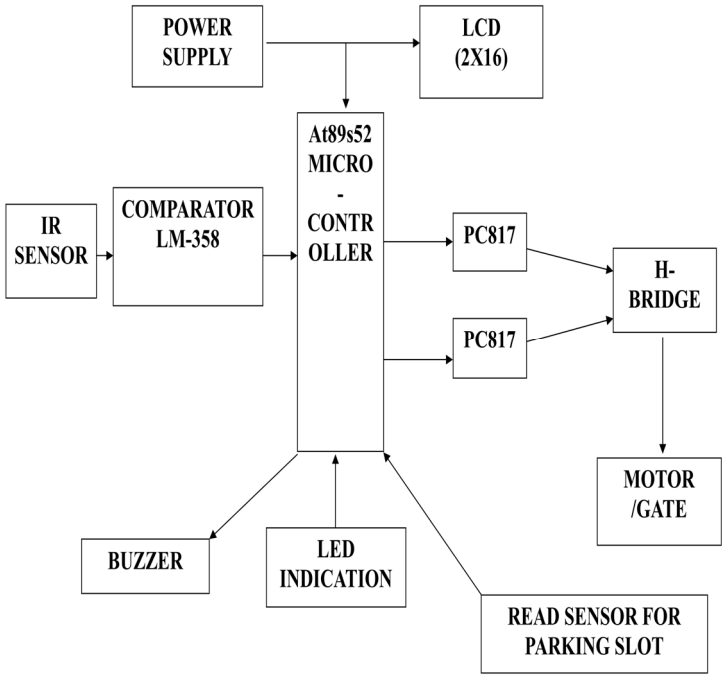


Fig. - 1 Basic Block Diagram of the proposed system

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In this paper we will show the Automation of the Smart Parking System In this paper when a car/vehicle enters in the parking system then Infra-red (IR) sensor sense the car and then the microcontroller comes into action and check if there is any free parking slot available in the parking space, if not it will not open the entrance gate and message will be displayed on the LCD screen i.e. 'NO SPACE' and if the vehicle owner stays more than 10 seconds in front of the entrance gate even though the parking space is not available, a buzzer will start making loud noises. If the space available the infrared sensor senses the car and then the Entrance gate will open automatically and shut down after few seconds as car enter in the parking lot. Door is open only when any empty space is available in the parking. If the space is available in the parking then LCD displays the closet parking place by showing message 'GO TO 6' OR any nearest parking slot available. Total number of parking space is occupied is shown by the different LEDs .Here in this paper we show only 8 LED for 8 different parking place.

There is also an Exit gate which works similar to the Entrance gate, it also consists of infrared sensors that senses the vehicle, similarly opens the gate according to it and when the car exits the parking space the gate shuts down automatically and microcontroller update the status about number of spaces available for parking on LCD display.

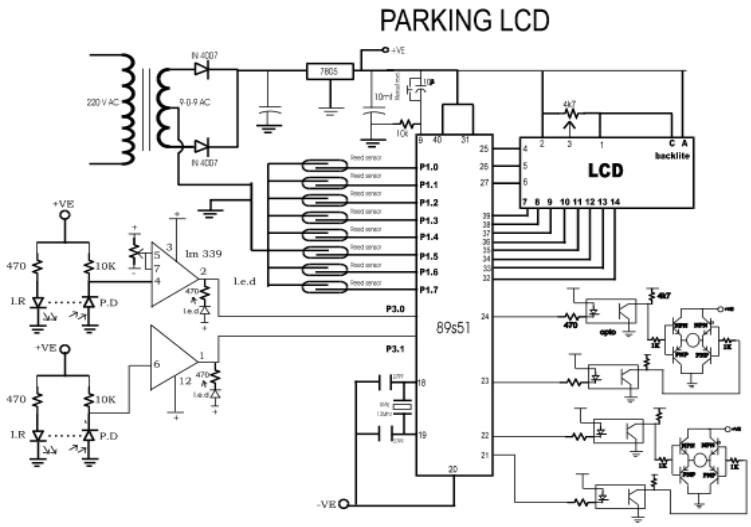


Fig. - 2 Circuit Diagram of the proposed system

IV. CONCLUSION

This mechanism can be implemented in future efficiently. There are some more advanced Vehicle parking spaces where Hydraulic lifts are uses to lift the car but that kind of papers installation requires a very large space and the installation cost is very high and cannot be implemented everywhere . But our proposed system can be used anywhere from a small space to large and the installation cost is not too high as compared to other automated parking system available.

This system not just only reduces the workload on workers but also improves the quality of parking services experienced by the Vehicle owners. Less hustle is required for finding a free parking space and the Vehicle owner will experience the fully automated system of parking. This will give the sense of proper parking and reduce the illegal parking on the roads as well as will reduce congestion on the roads due to car parking.

The main advantage of this paper is only it is automated parking system but also it will provide the vehicle owner the shortest path of parking space available for parking of the vehicle.

V. FUTURE SCOPE

In future, autoguided vehicle parking with android application.

A. An android application will be developed for the user to firstly check the parking space available near the destination they are visiting and let them choose the desired slot.

B. The user not only books a desired parking slot it has to pay the half of the parking charges in advance for booking the parking and fix the slot for an approximate time of 30 minutes. If the user cannot reach the parking at desired time then the slot will be reassigned and will be updated in the sensors. The advance money will not be refunded if the user does not reach the parking space within time provided.

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C. This can reduce the time of the user to searching the vacant parking lot. As a further study, different type of sensor systems can be used to improve this current system to detect the object and guide the vehicle driver or users rapidly. We will try to cut down the mechanical workload and try to make it nature friendly.

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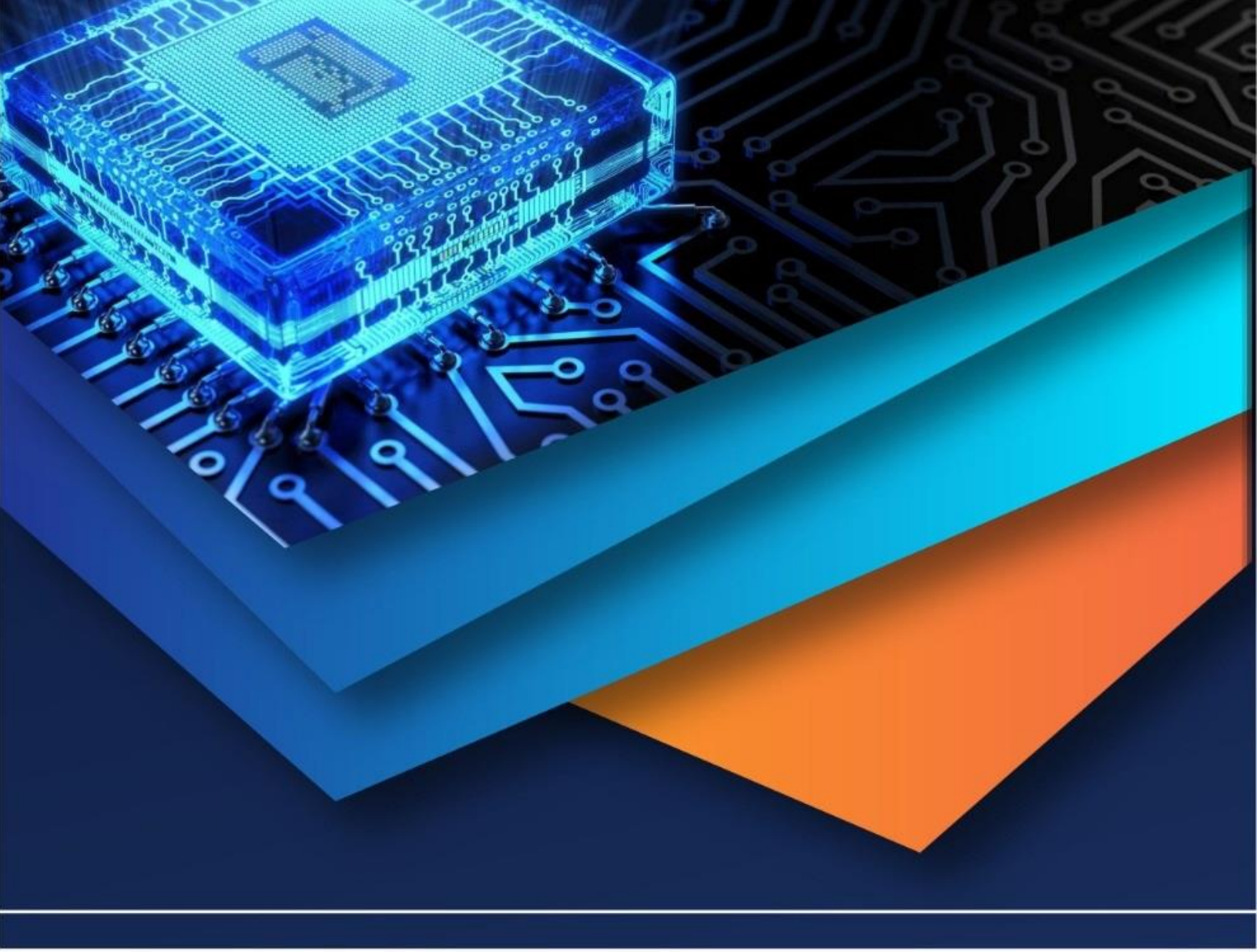
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