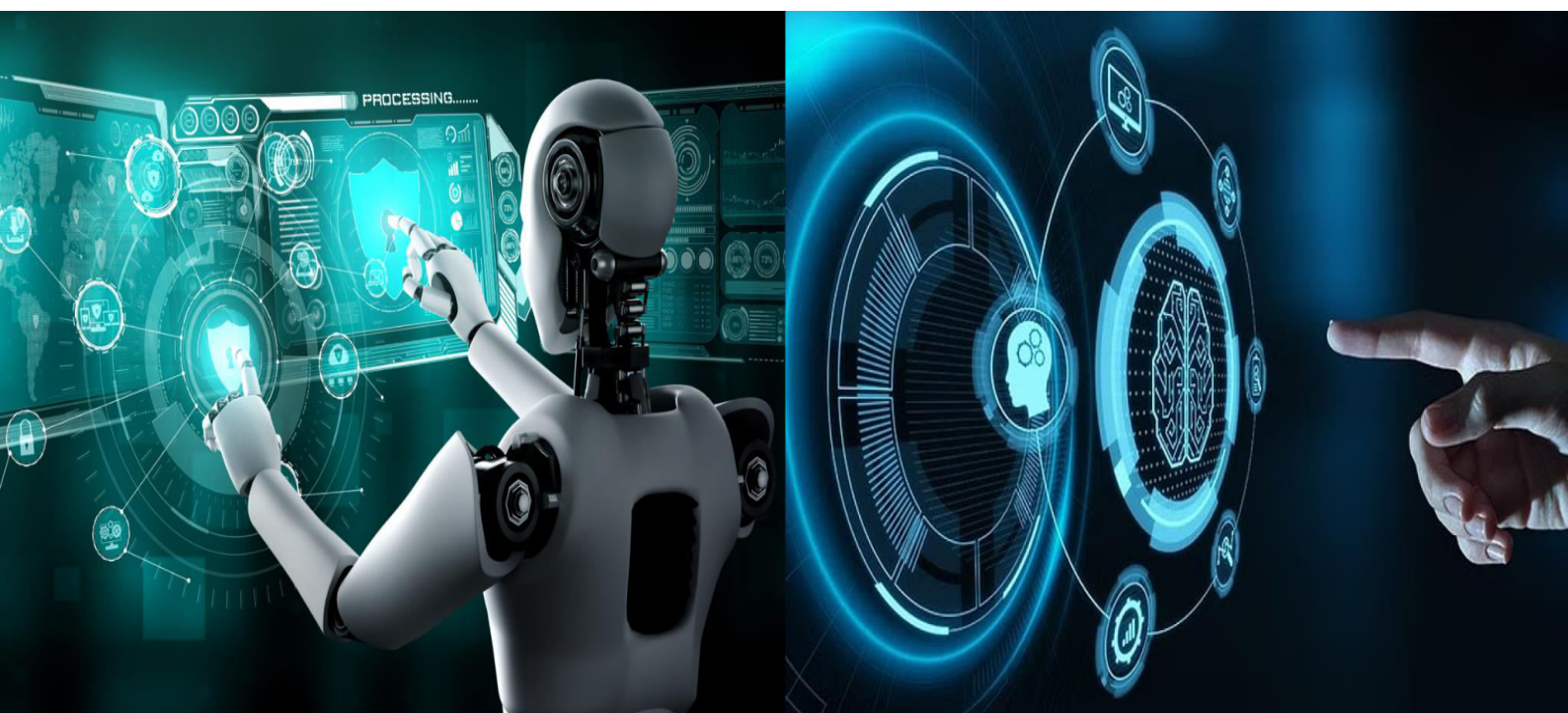


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Intelligent Parking Management System Using Infrared Sensor Networks

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ABSTRACT: The main aim of this work is to implement a cellar parking system based on sensor detection. The first part involves the designing of a counter that indicates the count of slots (parking slots) filled or vacant and the second part involves the designing of an indicates filled & vacant using LCD in order to prevent forward collision between vehicles. The LCD values depend upon the detection of sensor values which indicates the presence of a object. The value of LCD indicates the entry and the exit of vehicles from the slots, which in return specifies the presence of vehicle in opposite to the other vehicles at the entrance of the slots. Xilinx ISE Design Suite 14.7 Version are used for simulation and implementation of design.

KEYWORDS: Parking System, Verilog HDL.

I. INTRODUCTION

We know what happens when vehicle drivers can't find a parking space near their destination: they circle the block until their luck changes. Plenty of research has documented the great roll this takes on traffic congestion and air pollution. The field's leading scholar, UCLA parking guru Donald Shoup, has found that cruising for parking can account for some 15% of downtown traffic at the lower end of the spectrum, and up to 74% at the extremes. So much time is spent on the streets looking for a parking space – it's an awful waste of time and productivity, coming at the cost of peace of mind, and essentially pushing our roads off the edge with the heightened congestion. While the number of cars on the roads has expanded rapidly, the space in Indian cities has either remained the same or reduced due to the population pressure. This imbalance is the most important factor affecting mobility and accessibility in our cities. This is especially true for metropolitan areas, where land is limited and expensive and the rising need for parking spaces has further put pressure on land resources.

II. PROPOSEDSYSTEM

In the proposed system an LCD screen is placed at the entrance of the parking system and also a sensor which is activated to detect a vehicle coming. When a vehicle enters in, the LCD screen is used to display the availability of vacant slots. If the slots are available to park the vehicle it displays the details of exact vacant slots along with directions. If the slots are not available to park the vehicle, then it displays a message. Hence the person can choose another parking area which saves a lot of time.

The basic concept is, when a car enters the car park through the entry point, if there is an empty parking slot, the barrier will allow access to the car park. One big display is situated after entry which shows the remaining parking slots. As soon as the car enters through entry, sensor situated at entry gets activated and shows the empty parking slot. If there is no slots available for parking It shows the message that all slots are full and driver have to wait for some time. The original design required the use of sensors mounted in road. This system is usable for the parking slot seeker to know the exact empty parking slot.

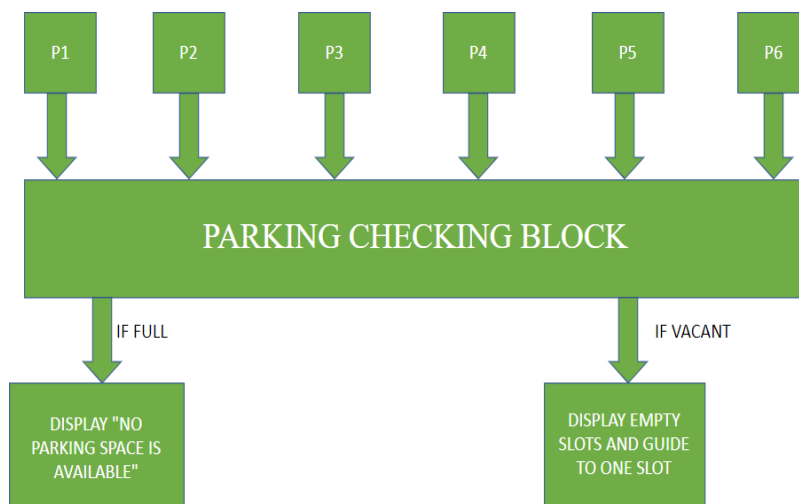
The purpose of Automatic Car Parking Indicator system is to guide the driver to a suitable parking space if one is available. The system would only allow entry to the car park, when there is space available. The system would also



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display the amount of space available in the car park. The car park system will consist of a systematic entry and exit point, which would allow entry depends upon the availability of spaces.



The above figure represents the block diagram of the proposed methodology. It consists mainly Nine blocks where six of them are used to indicate the parking slots and other three are the conditional blocks used to check the availability of slots. In parking check block, firstly an IR sensor is used to detect the vehicle and when it detects any vehicle the parking gate gets automatically opened and near the gate an LCD screen is placed to display the availability of frees lots.

If all the parking slots are filled then a message is displayed on the LCD screen that “No Parking Space is Available”. Hence it saves the time for the drivers to find other vacant parking slot without checking all the parking slots one by one. If any parking slot is empty then a message is displayed on the LCD screen about the details of the vacancy slot. After displaying it also guides the driver with directions to the vacancy slot.

III. EXPERIMENTAL RESULTS

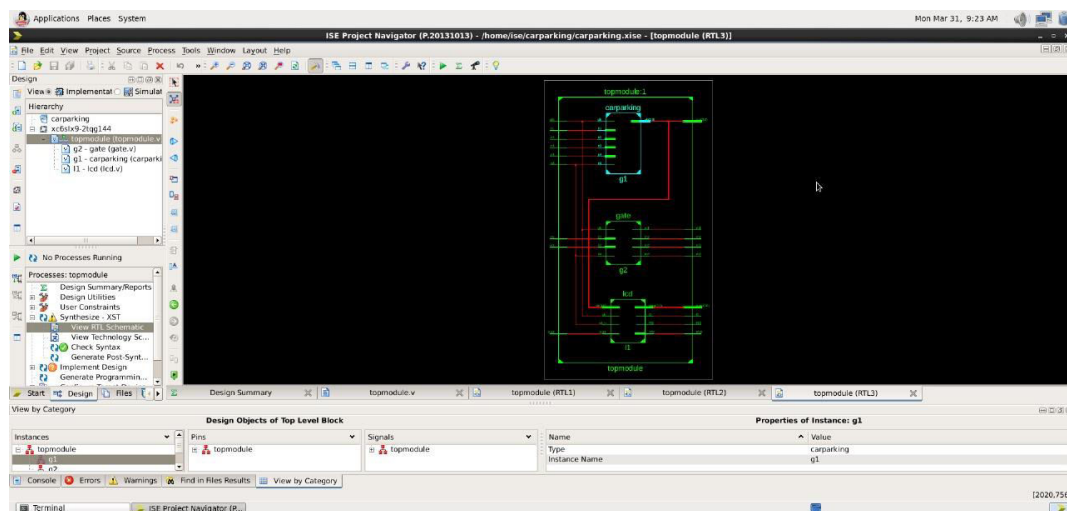


Fig.1.Schematic Diagram



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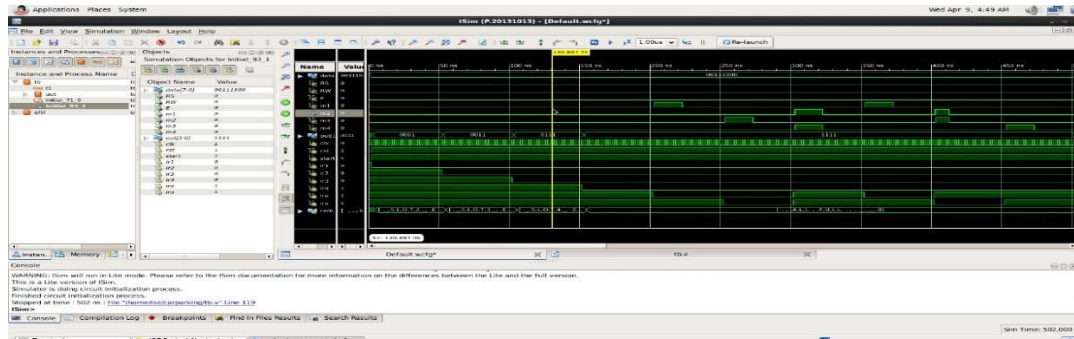


Fig.2.Simulation Result

IV. CONCLUSION

The **Car Parking Management System** using Verilog and sensors like IR and L293D driver offers an efficient and automated way to manage vehicle parking. The system provides real-time updates, enhances parking efficiency, and minimizes congestion. By integrating sensors with digital logic, this design ensures a systematic and reliable parking solution

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