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A REVIEW ON SMART CAR PARKING SYSTEM

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ABSTRACT:- Smart car parking project aims at providing a confusion free and easy parking. This project helps the drivers of the cars to park their vehicles with minimum wastage of time with accurate data of the accessibility of the space to stop over Android application. The administrator additionally can gather stopping charges proficiently and the drivers can book and pay for their parking spot over Android application. It incorporates an Arduino Uno and Arduino Mega as the microcontroller unit to which the servo engines, LCD, and IR sensors SR21-IC are communicated. The LCD shows the accessibility of the space, the counter keeps the check of the number of cars entering and exiting the parking space, the servo motor helps as gate for the entry and exit of the cars. The ultrasonic sensors detect the availability of the parking space.

I. INTRODUCTION

Trouble in Finding Vacant Spaces, Quickly finding an empty space in a multilevel parking garage is troublesome if not unthinkable, particularly on ends of the week or open occasions. Discovering spaces amid ends of the week or open occasions can take over 10 minutes for around 66% of guests. Stadiums or shopping center are swarmed at pinnacle periods, and trouble in finding empty openings at these spots is a noteworthy issue for clients. Inadequate car parking space \ prompt activity blockage and driver disappointment.

In the development of traffic management systems, an intelligent parking system was created to reduce the cost of hiring people and for optimal use of resources for car-park owners. Currently, the common strategy for finding a parking spot is manual where the driver typically tracks down a space in the road through karma and experience. This cycle requires some investment and exertion and may prompt the most pessimistic scenario of neglecting to find any parking spot on the off chance that the driver is driving in a city with high vehicle thickness. The option is to find a predefined vehicle leave with high limit. Nonetheless, this is certainly not an ideal arrangement on the grounds that the vehicle park could generally be far away from the client objective. Lately, research has utilized vehicle-to-vehicle and vehicle-toinfrastructure connection with the backing of different remote organization innovations like radio recurrence

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distinguishing proof (RFID), Zigbee, remote wreck organization and the Internet. This study aimed to provide information about nearby parking spaces for the driver and to make a reservation minutes earlier using supported devices such as smartphones or tablet PCs. Furthermore, the services use the ID of each vehicle in booking a parking space. However, the current intelligent parking system does not provide an overall optimal solution in finding an available parking space, does not solve the problem of load balancing, does not provide economic benefit, and does not plan for vehicle-refusal serviceTo resolve the aforementioned problems and take advantage of the significant development in technology, the Internet-of-Things technology (IoT) has created a revolution in many fields in life as well as in smart-parking system (SPS) technology. The present study proposes and develops an effective cloud-based SPS solution based on the Internet of Things. Our system constructs each car park as an IoT network, and the data that include the vehicle GPS location, distance between car parking areas and number of free slots in car park areas will be transferred to the data center. The data center serves as a cloud server to calculate the costs of a parking request, and these costs are frequently updated and are accessible any time by the vehicles in the network. The SPS is based on several innovative technologies and can automatically monitor and manage car parks. Furthermore, in the proposed system, each car park can function independently as a traditional car park. This research also implements a system prototype with wireless access in an open-source physical computing platform based on Arduino with RFID technology using a smartphone that provides the communication and user interface for both the control system and the vehicles to verify the feasibility of the proposed system.

II. SYSTEM DESIGN

This is the pictorial representation of the project where each slot is equipped with the IR sensor which is used to detect the presence of the vehicle.

As total 6 sensors are put in 6 slot and two IR sensors are placed to automate the gate opening and closing. LCD display is used to detect the presence of vehicle in slot and available slot in the parking station. All the configuration is controlled by the Arduino uno development board.

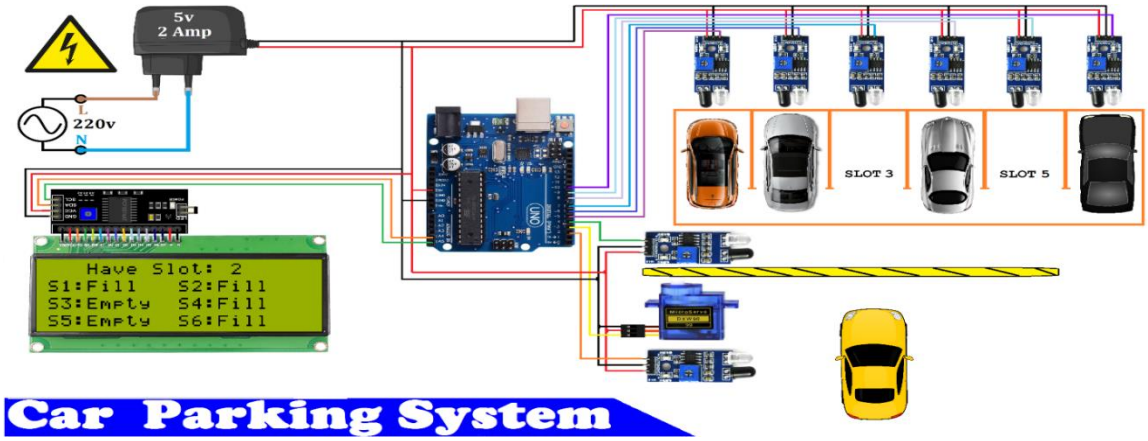

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Fig 1. System design

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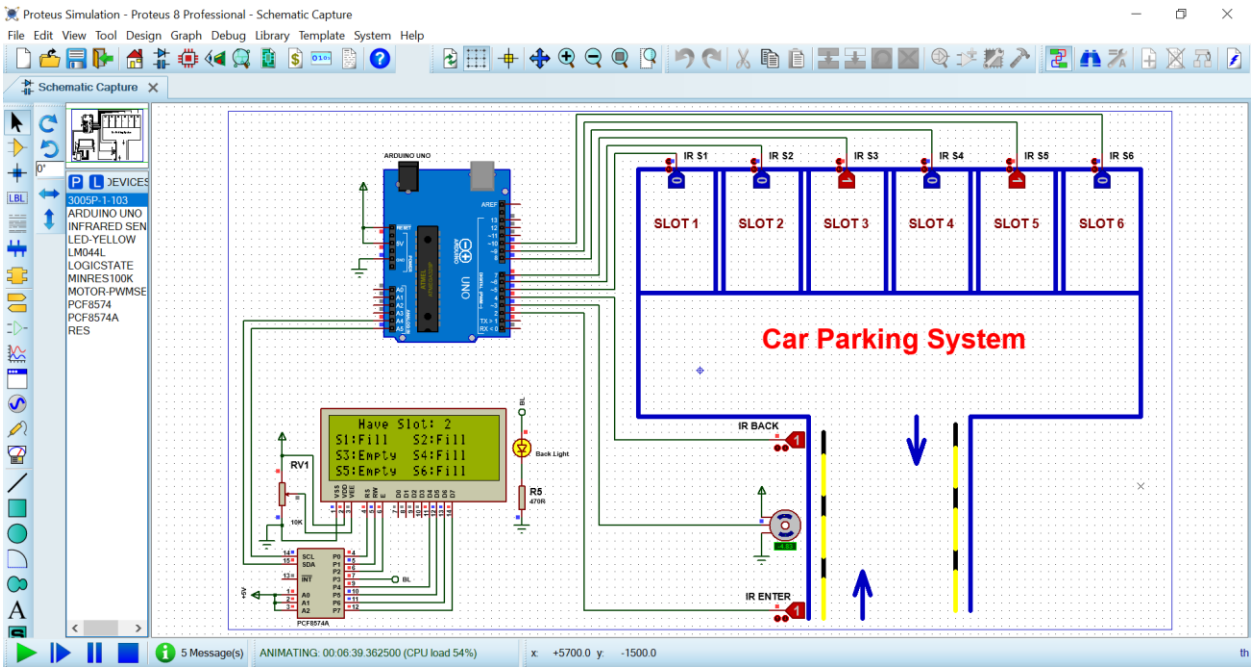

Fig. 2 Circuit diagram

Above diagram represent the circuit diagram drawn in the proteus software. It shows the interfacing of IR sensors, servo motor and LCD interfacing with Arduino uno board.

Each sensor needs the power so it's provided by the Arduino uno and the sensors out pin in connected to the Arduino uno's GPIO pins. Each sensor reads 0 when there is vehicle in the slot or in the entrance. So, we can able to configure the logic accordingly to control the gate and to show the status of the slot on the LCD display

III. COMPONENT USED

a) Arduino UNO

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. You can tinker with your

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UNO without worrying too much about doing something wrong. The worst-case scenario is that you would have to replace the chip and start again :)

b) IR Sensor

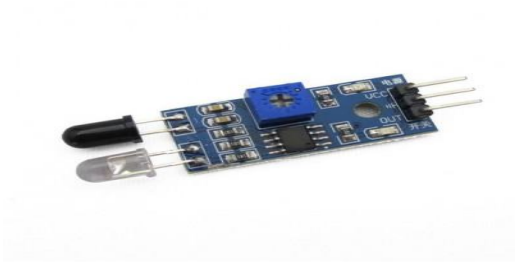

Fig. 3. IR sensor

The 5 VDC supply input is given to the VCC pin and the supply negative is connected to the GND terminal of the module. When no object is detected within the range of the IR receiver, the output LED remains off.

a) Servo motor:

Fig. 4. Servo motor

After selecting the right Servo motor for the project, comes the question how to use it. As we know there are three wires coming out of this motor. The description of the same is given on top of this page. To make this motor rotate, we have to power the motor with +5V using the Red and Brown wire and send PWM signals to the orange color wire. Hence, we need something that

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could generate PWM signals to make this motor work, this something could be anything like a 555 Timer or other Microcontroller platforms like Arduino, PIC, ARM or even a microprocessor like Raspberry Pie. Now, how to control the direction of the motor? To understand that let us a look at the picture given in the datasheet.

b) LCD display:

Fig. 5. LCD display

16x2 LCD modules are very commonly used in most embedded projects, the reason being its cheap price, availability, programmer friendly and available educational resources.

E) I2C Serial Interface Adapter Module for LCD:

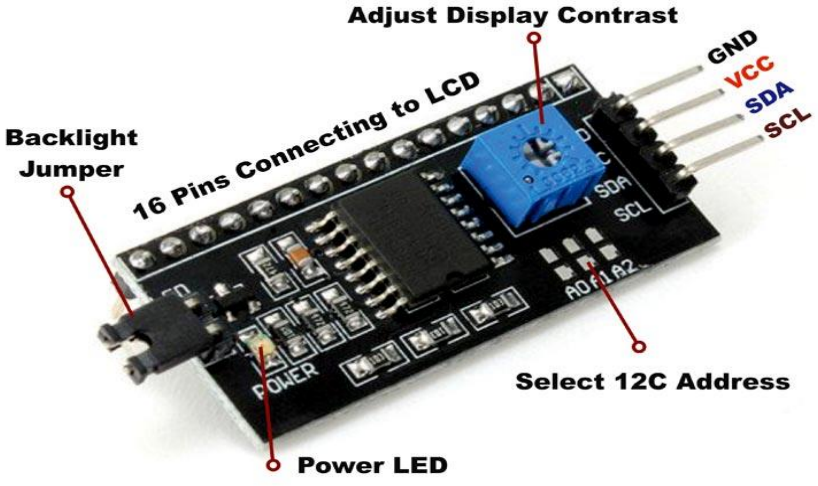

Fig. 6. I2C Serial Interface Adapter Module for LCD

Due to limited pin resources in a microcontroller/microprocessor, controlling an LCD panel could be tedious. Serial to Parallel adapters such as the I2C serial interface adapter module with PCF8574 chip makes the work easy with just two pins. The serial interface adapter can be connected to a 16x2 LCD and provides two signal output pins (SDA and SCL) which can be used to communicate with an MCU/MPU.

IV. CONCLUSION

In the paper we can say that the by utilizing computerization we can diminish the expense of the manual activity of the stopping framework which can prompt increment the benefit of an association to extraordinary degree. This will likewise prompt keep away from tumult which by and large occur in the stopping region.

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