

WALCHAND COLLEGE OF ENGINEERING, SANGLI
(Government-Aided Autonomous Institute)



Department of Electronics Engineering
Third Year B. Tech. Project Report

“Smart Parking System”

Submitted By

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Under the guidance of

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Abstract:

In day today's life the use of vehicles are increasing very fastly. Because of increasing in vehicles the main problem occurs in many cities that is parking problem. Some times people waste their time for finding out the parking slot to park their vehicles. because of lack of sufficient area the people needs more time to park his /her vehicle .To avoid this parking we are made one project that can handle parking issues very easily the project name is smart parking system .in this smart parking system we used arduino uno as controller that can control everything included in this project the project consisting of servo motor and IR sensor.

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1. Introduction:

In day today's life the use of vehicles are increasing very fastly. Because of increasing in vehicles the main problem occurs in many cities that is parking problem. Some times people waste their time for finding out the parking slots to park their vehicles. because of lack of sufficient area the people needs more time to park his /her vehicle .To avoid this parking problem we are made one project that can handle parking issues very easily the project name is smart parking system. In this smart parking system we used arduino uno as controller that can control everything which is included in this project. The project consisting of a servo motor, IR sensor and 20x4 LCD display .Two IR sensors are used at gate which will detect the vehicle present at the gate and send the signal to controller and gate will open (here for opening and closing of gate we used servo motor) .four IR sensors are used at every parking slots these IR sensors will check the status of parking slots whether the vehicle is present in parking slot or not if vehicle is present in slot then it will display on LCD i.e. slot is fill otherwise it will display slot is empty on LCD display.

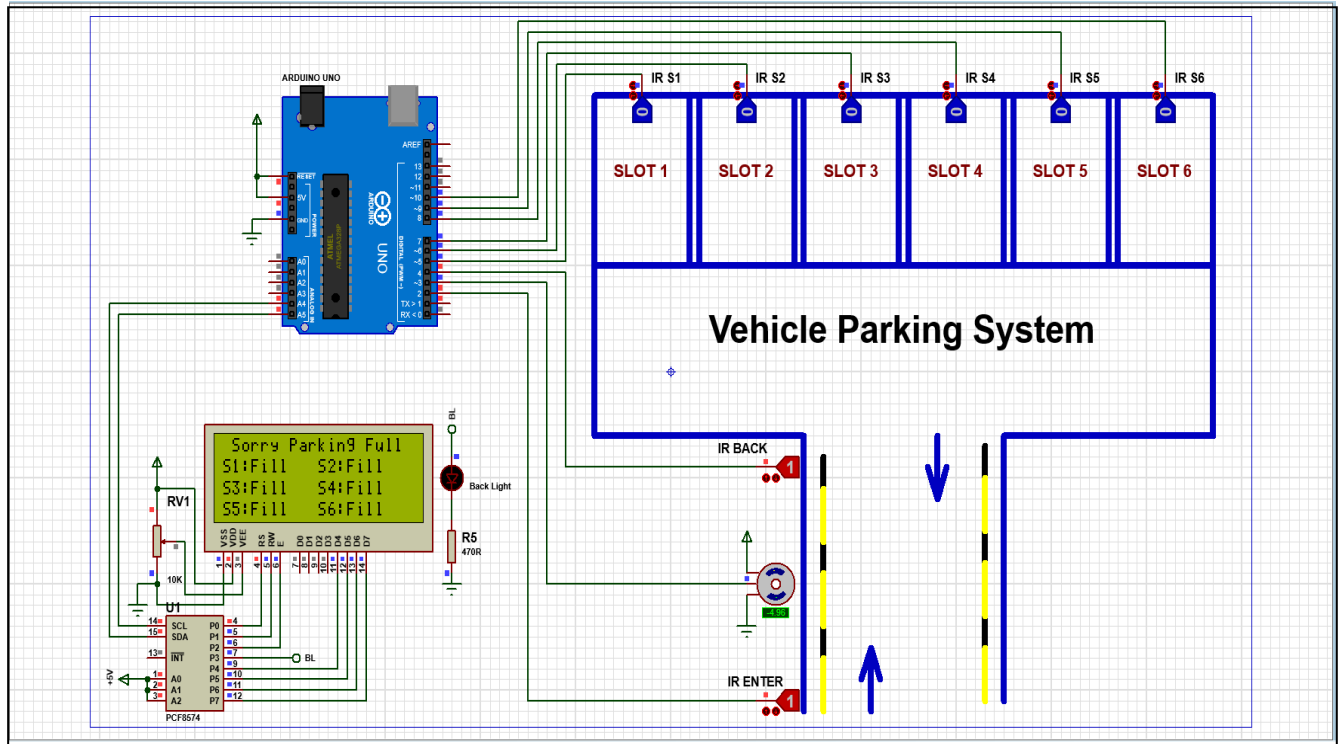
2. Literature Survey:

1. Proposed a model is to save the effort, time and obviously fuel using IOT while searching for a parking area. The system consists of hardware components like master Arduino uno, infrared (IR) sensors and servo motor.

2. Suggested a system in which an IR Sensors is used to sense the occupancy of slot. For IR sensor a specific distance value is set as threshold for non-occupied status. When the slot is occupied, the distance calculated by transmitting light rays by LED and detecting by photo detector will always be less than the set threshold. All distance values will below the set threshold classifies the slot as occupied. The Parking slot status is sent to Arduino UNO board.

3. Design:

3.1 Circuit Diagram:



3.2 Block Diagram:

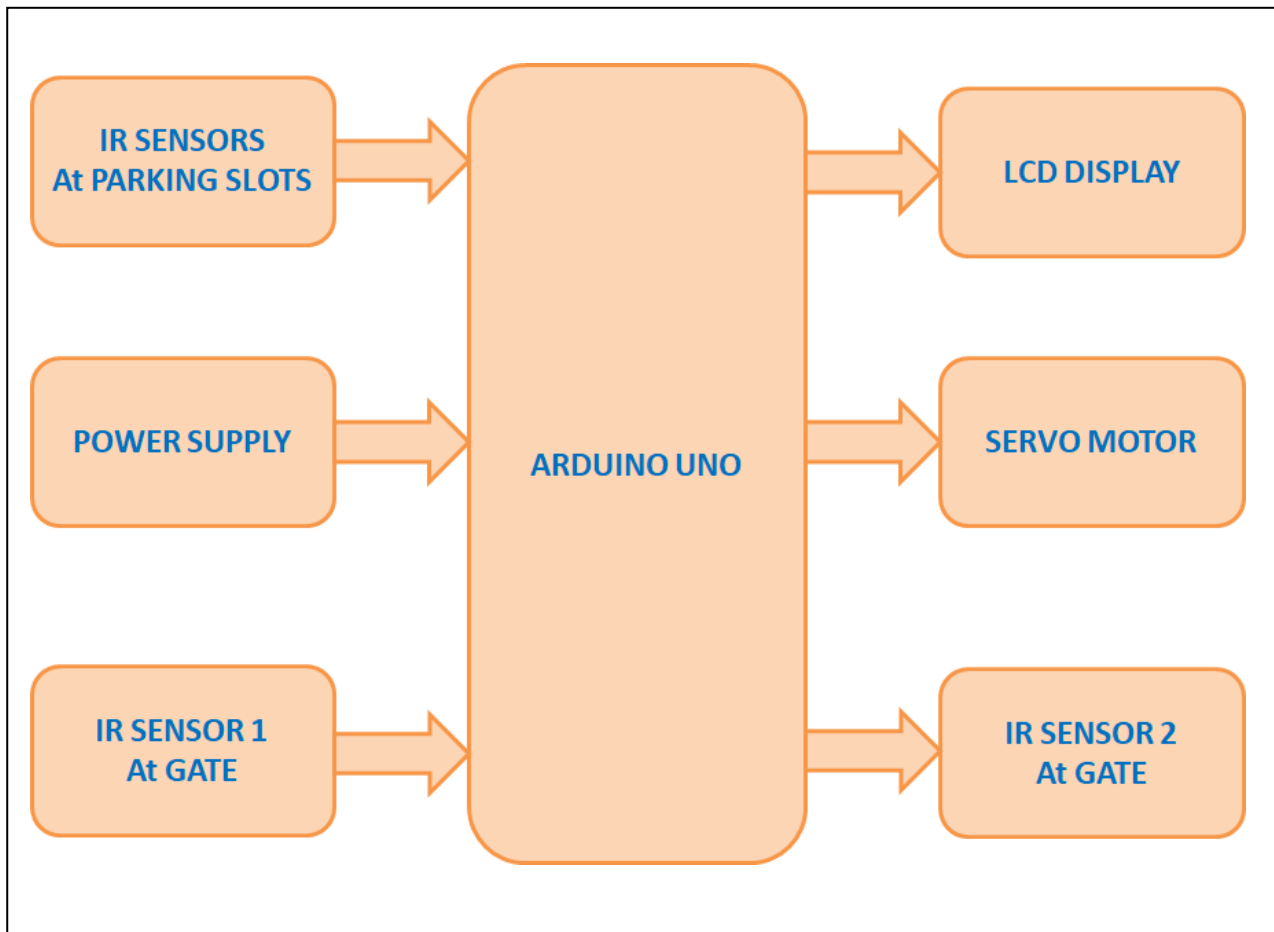


Fig. Block Diagram

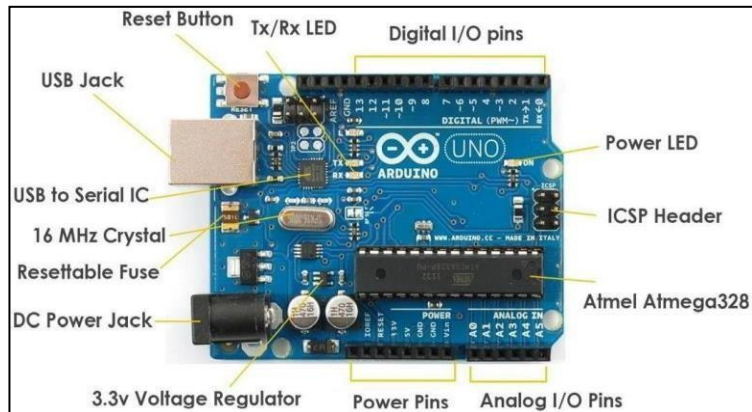
In this Smart Parking System, the Arduino microcontroller will control all the process. Here we are using IR sensor to check status of parking slots whether the vehicle is present in slot or not. The parking availability data will be displayed on LCD display. It involves two more IR sensors that is used to monitor the vehicles coming on gate and one servo motor used as gate controller depending upon the IR sensor output the servo motor will work. 20x4 LCD is used to display the parking slots status. Here the ARDUINO UNO will control the complete process and also send the parking availability information to LCD so that it can be monitored at gate. Two IR Sensors are used at entry and exit gate to detect the presence of car and automatically open or close the gate.

4. Components Used:

SR.NO	COMPONENT	QUANTITY
1.	Arduino Uno	01
2.	IR Sensors	06
3.	DC Servo motor	02
4.	20x4 LCD Display	01
5.	Battery (9V)	01
6.	Connecting Wires	-
7.	PCB	01
8.	Male Header	-
9.	Female Header	-

5. Component Description:

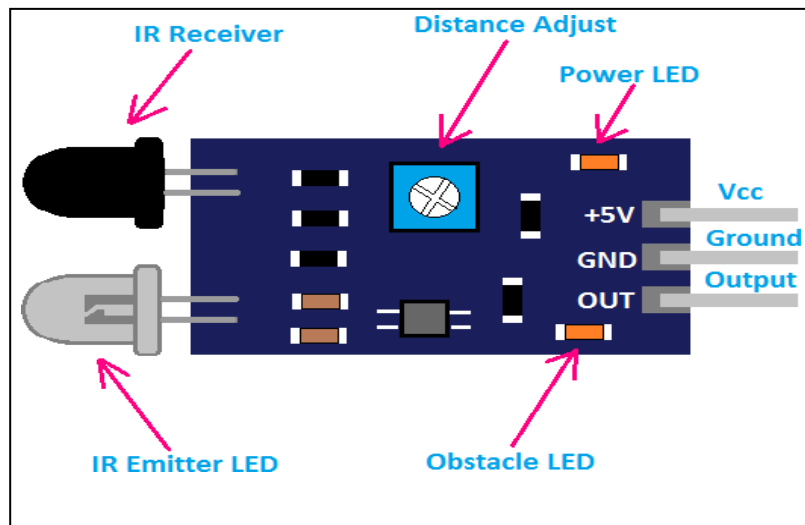
5.1 Arduino UNO:



5.1.1 Arduino UNO Specifications:

Microcontroller	ATmega328P – 8 bit AVR family microcontroller
Operating Voltage	5V
Recommended Input Voltage	7-12V
Input Voltage Limits	6-20V
Analog Input Pins	6 (A0 – A5)
Digital I/O Pins	14 (Out of which 6 provide PWM output)
DC Current on I/O Pins	40 mA
DC Current on 3.3V Pin	50 mA
Flash Memory	32 KB (0.5 KB is used for Bootloader)
SRAM	2 KB
EEPROM	1 KB
Frequency (Clock Speed)	16 MHz

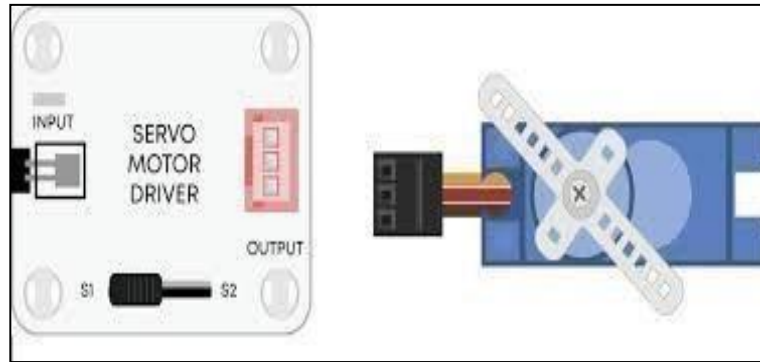
5.2 IR Sensor:



5.2.1 Specification:

Pin No:	Pin Name:	Description
1	Vcc	This pin powers the module, typically the operating voltage is +5V
2	Ground	Used to connect the module to system ground
3	Digital Out	You can also use this sensor to get digital output from this pin, by setting a threshold value using the potentiometer
4	Distance Measuring Range	2 to 30
5	Integrated circuit	LM-393

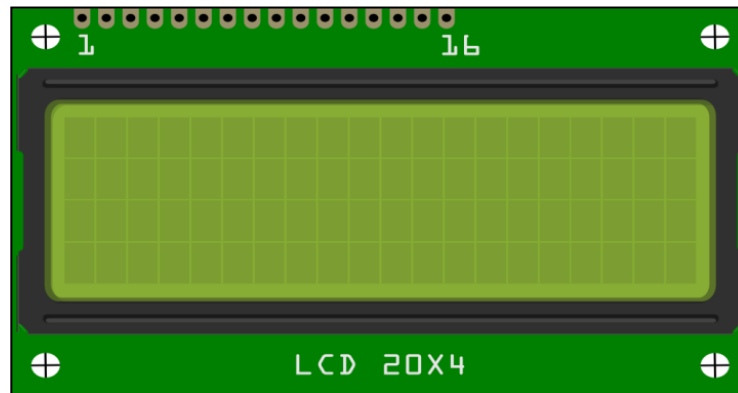
5.3 Servo Motor:



5.3.1 Pin Description

Pin No.	Wire Color	Pin Description
1	Red	5V supply is used to Powers the motor.
2	Brown	Ground wire is used to connect the system to ground.
3	Orange	PWM signal is given through this wire to drive the motor.

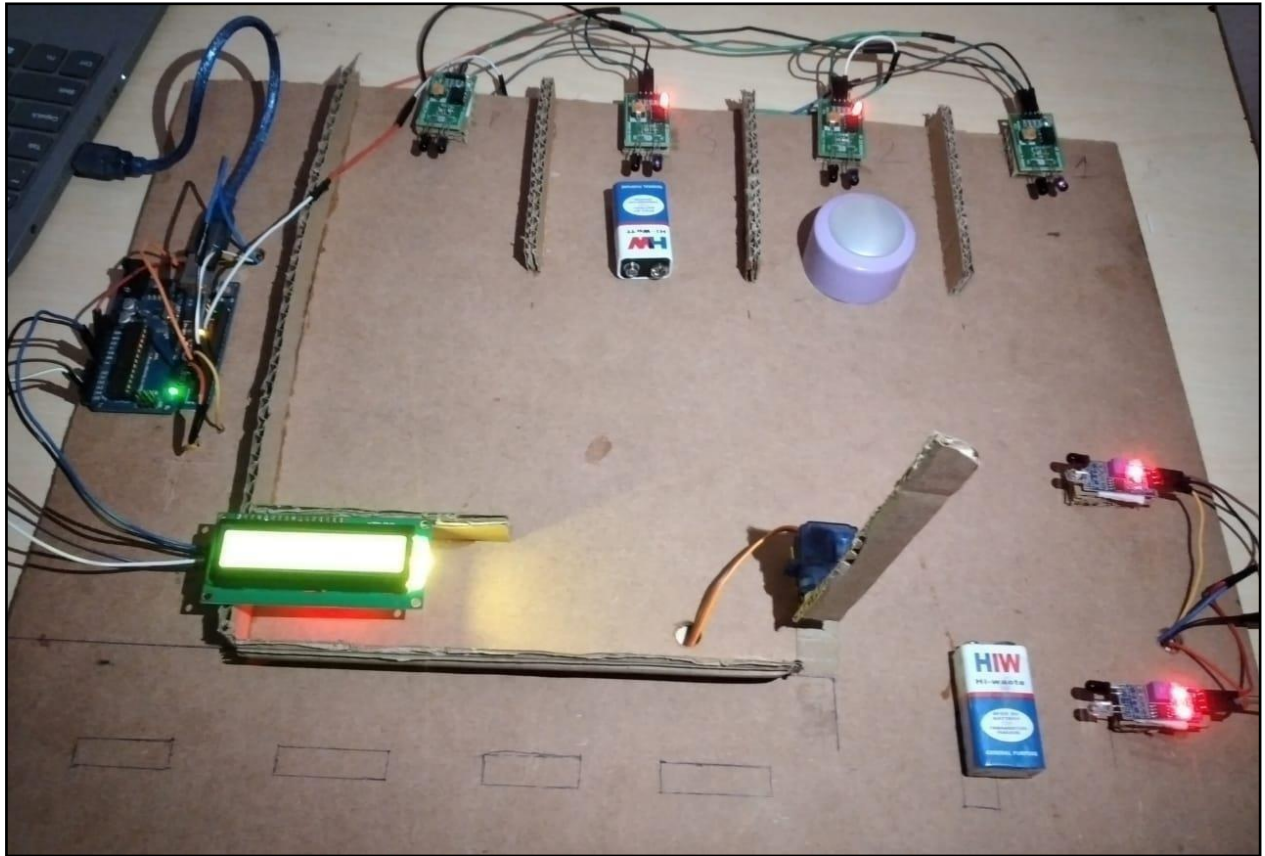
5.4 LCD Display:



5.4.1 LCD PIN Description:

Sr.No:	Pin Name	Description
1	VSS	It is ground pin.
2	VDD	Power supply 5V(DC).
3	Vo	This pinout is used to set the contrast.
4	RS	It is used to H/L register select signal.
5	R/W	It is used to H/L read/write signal.
6	ENABLE	It is used to enable signal.
7-14	DB0-DB7	Databus for 4-bit and 8-bit mode.
15	LED+	Used to set backlight anode.
16	LED-	Used to set backlight cathode.

6. Hardware Design:



7. Merits:

1. Optimized Parking.
2. Reduced Traffic Problem.
3. Enhanced User Experience.
4. Real-Time Data and Trend Insight.
5. Reduced Management Costs.
6. Increased Service and Brand Image.

8. Conclusion & Future Enhancements:

8.1. Conclusion:

In this project, we have presented the concept of Smart Parking System which will be able to reduce the traffic congestion which will also improve the citizen's quality of life. A driver can find the parking spaces available in a given area and get the parking.

8.2. Future Scope:

The Smart parking system based on Slot booking is implemented, using the Arduino UNO microcontroller. Using the slot allocation method, we can check status of slot whether the vehicle is parked in the slot or not. It is an efficient idea for solving parking problems, which overcomes all the traffic congestion which occurs in day today's life. This work can be further modified as a fully automated system using multilayer parking method. Safety measures such as tracing the vehicle numbers and face recognition of the drivers so as to avoid theft and one more thing is automatic billing process can also be added. We plan to expand the tests on the real time environment where the drivers /users can have the "Smart Parking" system in their handheld devices.

9. References:

Books:

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