Smart Car Parking System

Mentored By

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OBJECTIVES

- To Study Integration of Electrical Sciences and Electronics by their applications in daily life (here, Smart Parking Systems)
- To study and optimize the usage of time, energy and space wisely through smart systems.

INTRODUCTION

- Smart Car Parking System is an integrated system to organize cars in public areas.
- All vehicles enter into the parking and waste time for searching for parking slot .

HYPOTHESIS

CURRENT SCENARIO

- Person doesn't know whether Parking is Available or not until he travels in the entire parking
- It gets chaotic in the parking, when even after being full, more cars keep on entering the parking

REMEDIES PROPOSED

- Indicating the Number of Parking Slots available in the parking help save time and energy
- Not letting more cars enter once parking is full helps in avoiding chaos

EXISTING PROBLEM

- With increase in the population, number of vehicles increases and due to unmanaged parking it leads to many problems.
- Some of the problems include Fights and Accidents in Parking due to parking at wrong places
- Blocking of Traffic in Open Parking like Local Markets due to unsystematic parking of cars

PROPOSED SYSTEM

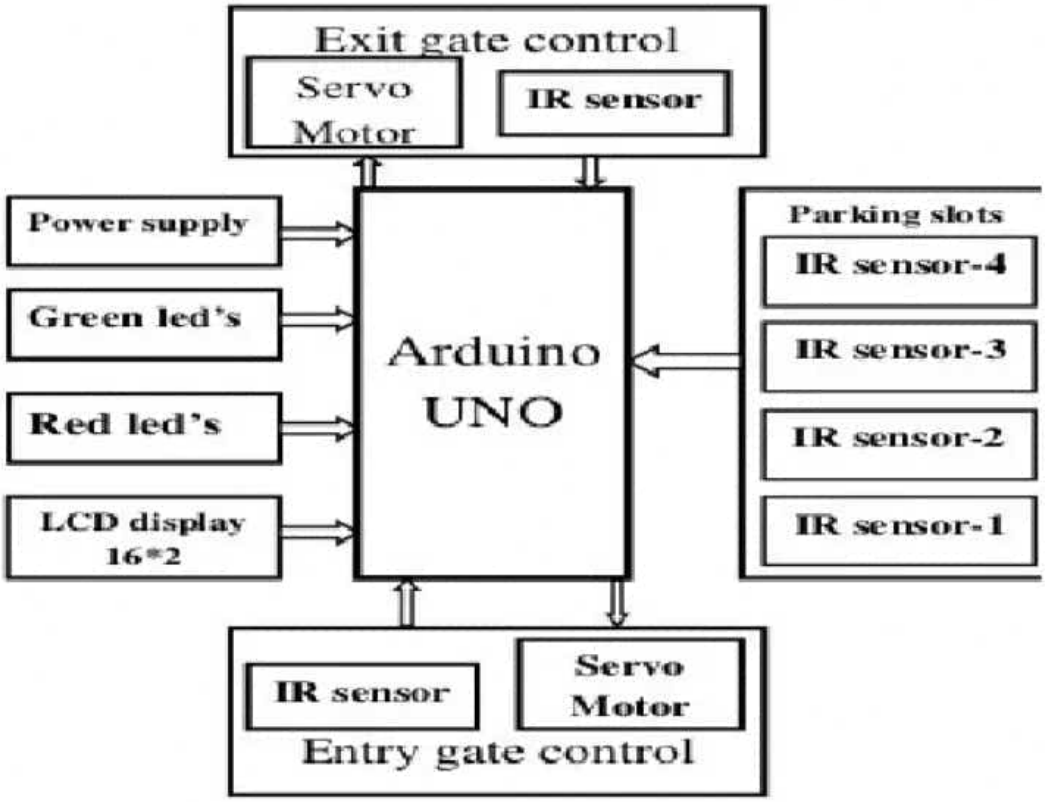
TO OVERCOME PROBLEM OF AVAILABILITY IN PARKINGS

- To inform a person before entering the parking about the number of available parking slots in the parking by a display installed at the entrance

TO OVERCOME THE PROBLEM OF EXTRA CARS AFTER PARKING IS FULL

- By installing a barrier at the entrance and closing it once all parking slots are full, hence not allowing vehicle to enter until a slot is empty

BLOCK DIAGRAM



Main Components Required

HARDWARE COMPONENTS

- Arduino UNO
- IR Sensors
- LCD Display
- Servo Motors
- LED Lights

SOFTWARE COMPONENTS

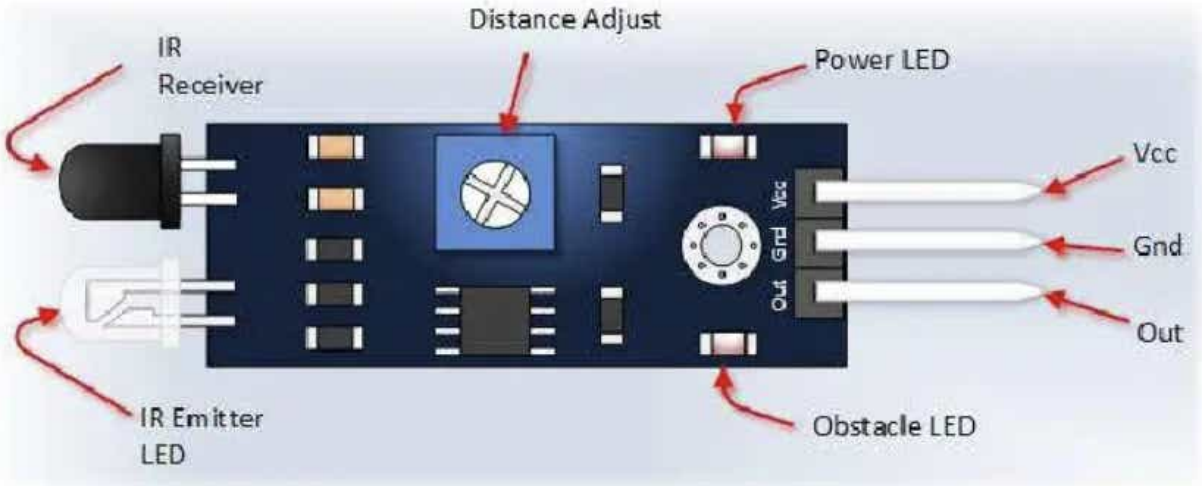
- Arduino IDE

ARDUINO UNO

- Microcontroller: ATmega328
- Operating Voltage: 5V
- Input Voltage (recommended): 7-12V
- Input Voltage (limits): 6-20V
- Digital I/O Pins: 14 (of which 6 provide PWM output)
- Analog Input Pins: 6
- Flash Memory: 32 KB
- Clock Speed: 16 MHz

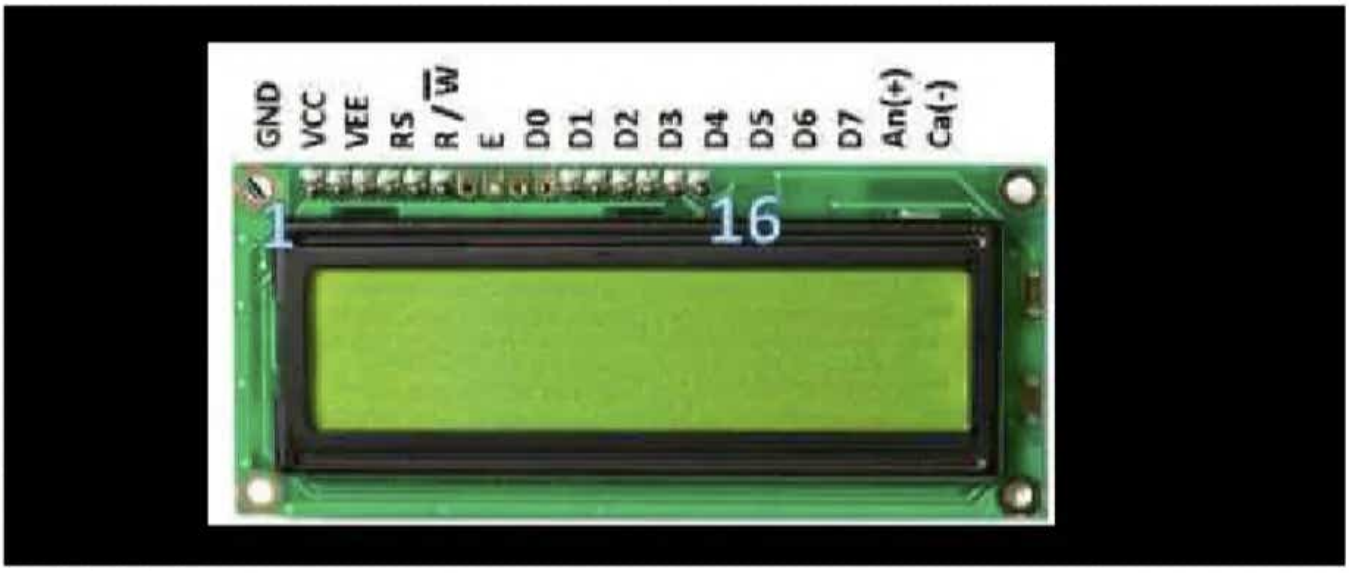
INFRARED SENSOR

- Active Output Level : Outputs Low Logic Level When Obstacle is Detected
- On board Obstacle Detection LED Indicator



LCD DISPLAY

- A 16x2 LCD Display is very basic module and is very commonly used in various devices and circuits. A 16x2 LCD means it can display 16 characters per line and there 2 such lines



SERVO MOTOR

- A servomotor is a rotary actuator that allows for precise control of angular position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback.

- Servo motors are used to lift the gates at the entry and exit of the parking area.

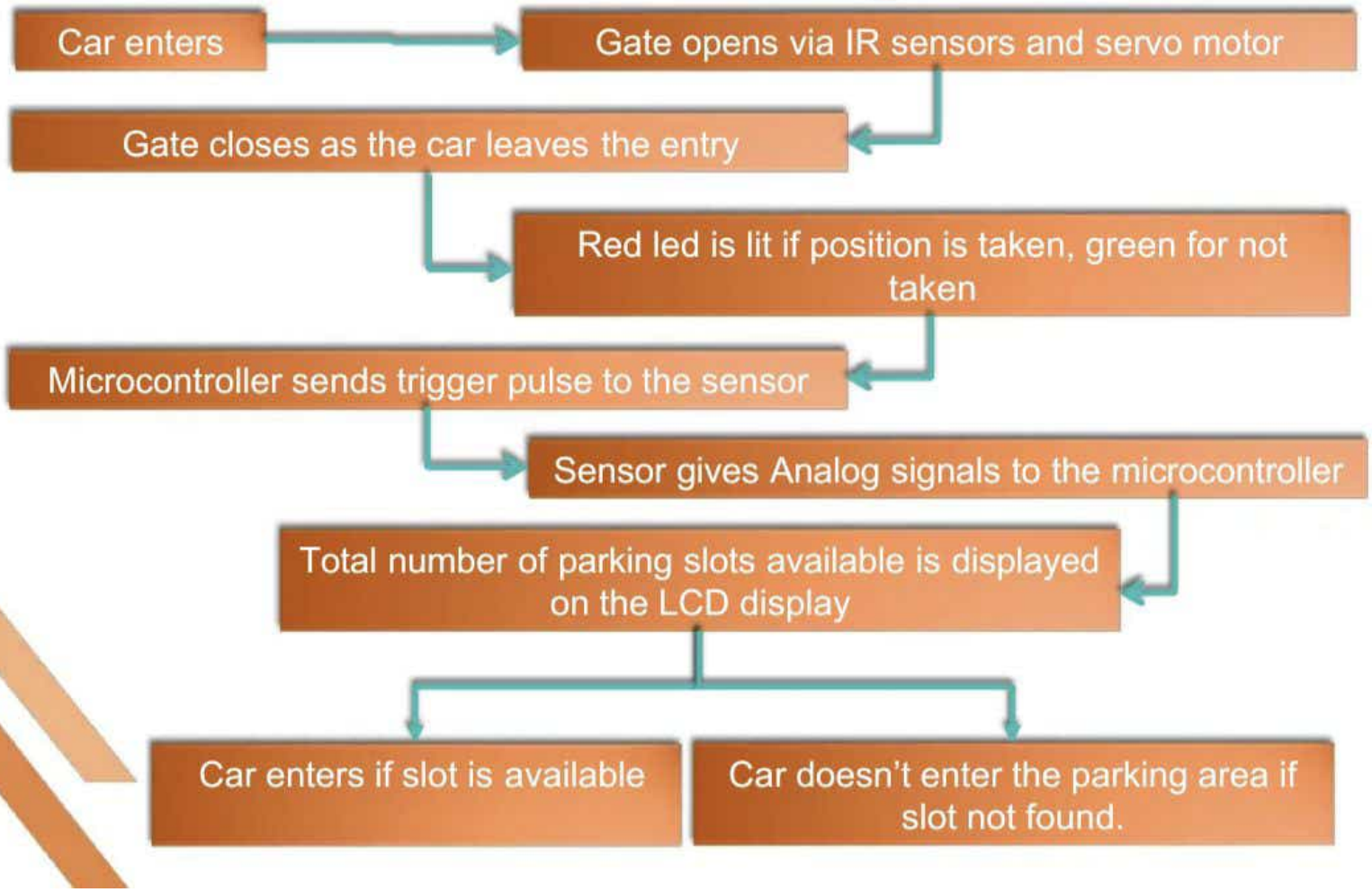
LED

- A light-emitting diode (LED) is a semiconductor light source. LED's are used as indicator lamps in many devices, and are increasingly used for lighting.

ARDUINO IDE

- The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in the programming language Java. It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic indenting, brace matching, and syntax highlighting, and provides simple *one click* mechanisms to compile and upload programs to an Arduino board.

FLOWCHART


Car enters
Gate opens via IR sensors and servo motor
Gate closes as the car leaves the entry
Red led is lit if position is taken, green for not taken
Microcontroller sends trigger pulse to the sensor
Sensor gives Analog signals to the microcontroller
Total number of parking slots available is displayed on the LCD display
Car enters if slot is available
Car doesn't enter the parking area if slot not found.

ADVANTGES & APPLICATIONS

- Optimized Parking
- Reduced Traffic
- Increased Safety
- Real- Time Data and Trend Insight
- Increased Service and Brand Image

DIVISION OF WORK

Particulars	Name
Layout and Designing	Suryaprakash
Hardware Prototyping	Devaki
Software & Coding	Divya
Technical Help	Saranya
Content and Presentation	Adhilakshmi

FUTURE SCOPE

- This project helps making a beginning in the broader projects of Smart Cities and Artificially Intelligent Systems
- Integrating the same with IoT helps making a much more automated and controllable system
- An App linked to a Wi-Fi Module will help bring the entire system to our mobiles and this system can also be used for payments and pre booking of slots & fines


THANK YOU