"Smart Parking System Using Arduino"

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Motivation

People cannot find parking in popular places. Especially during holidays, traffic is always bad. People cannot locate their car in large parking slots. Person doesn’t know whether Parking is Available or not until he travels in the entire parking. Current scenario It gets chaotic in the parking, when even after being full, more cars keep on entering the parking. 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.

Figure 1: Road Traffic

Objective

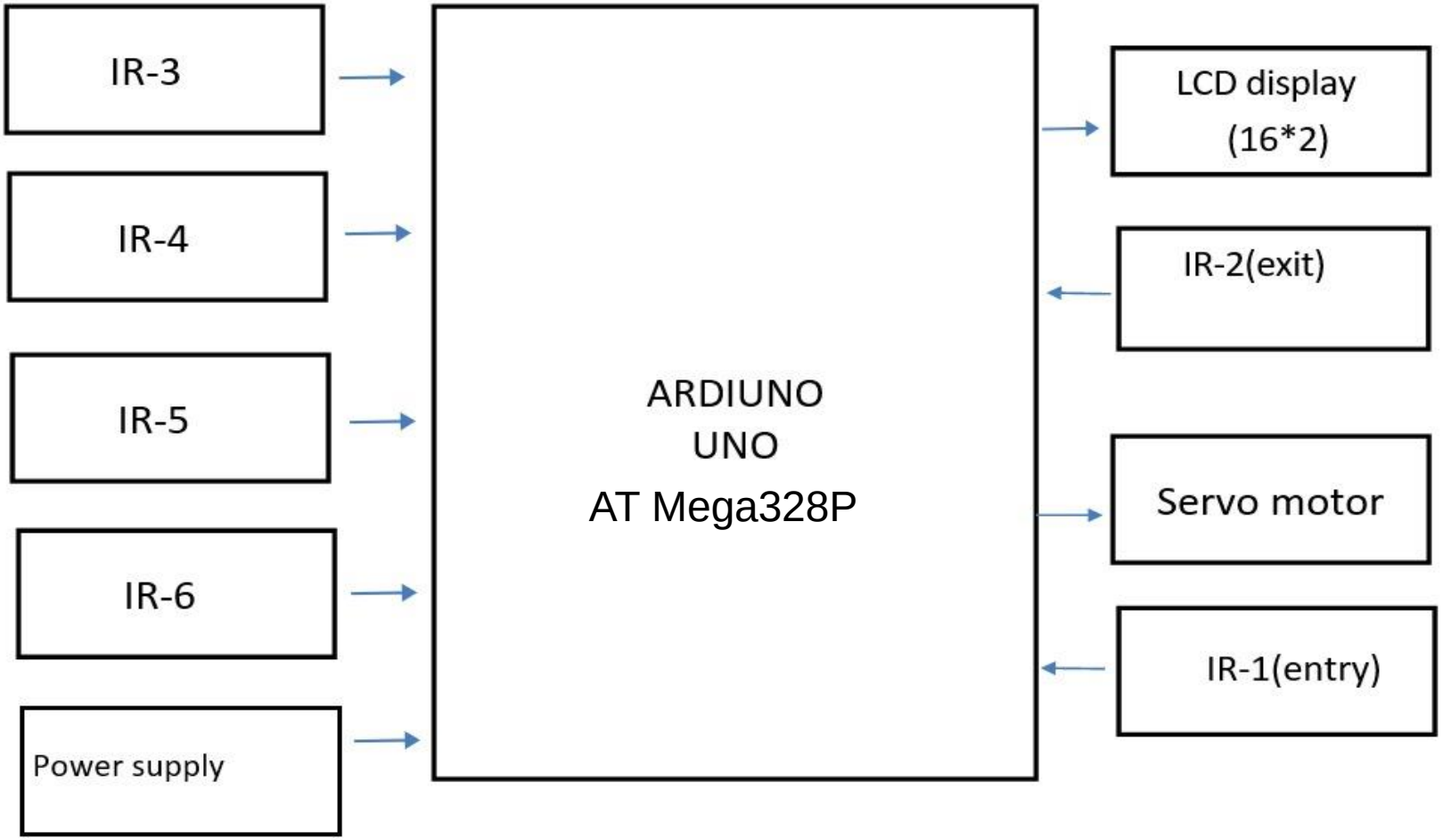
Smart Parking is a parking solution that can include in-ground Smart Parking sensors, cameras or counting sensors. Smart Parking and its Smart Parking Sensors can be seen as a part of smart cities. These smart cities are cities that are driven by an IT infrastructure and by using this infrastructure, cities can enhance the quality of life and improve economic development for its inhabitants. Becoming a smart city can be a good way to collect historical data in a relatively easy way. By collecting this data, cities can analyze how processes, like parking can be optimized.

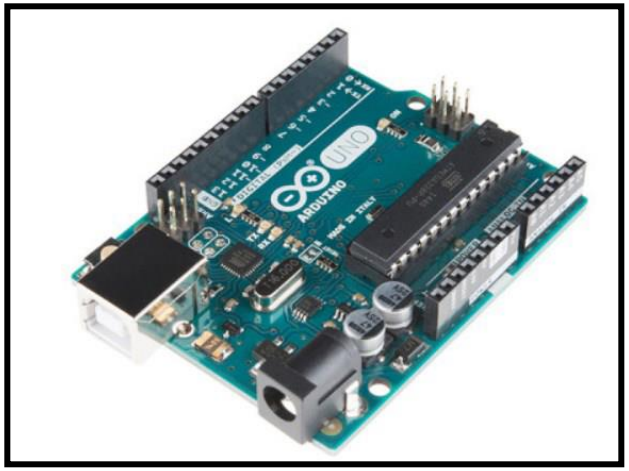
Introduction

A smart parking system using Arduino is designed to manage parking spaces in a more efficient and convenient way. It typically involves sensors placed in parking spots to detect the presence of vehicles. These sensors are connected to an Arduino board, which processes the sensor data and communicates with a central system or a mobile app.

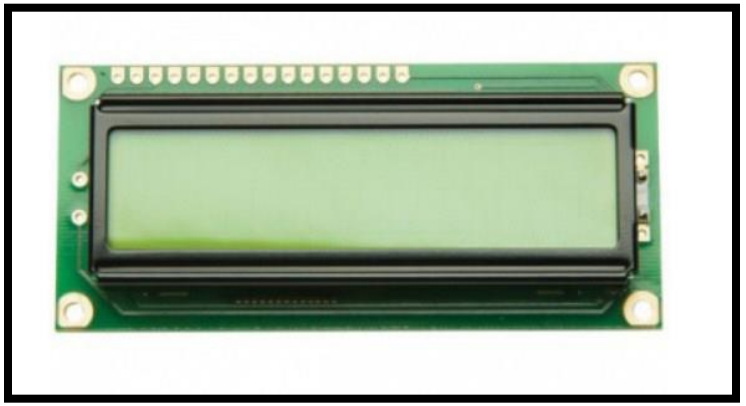
The system can provide real-time information about available parking spaces, allowing drivers to easily find and reserve a spot. It can also optimize parking space usage, reduce traffic congestion, and improve overall parking management.

BLOCK DIAGRAM

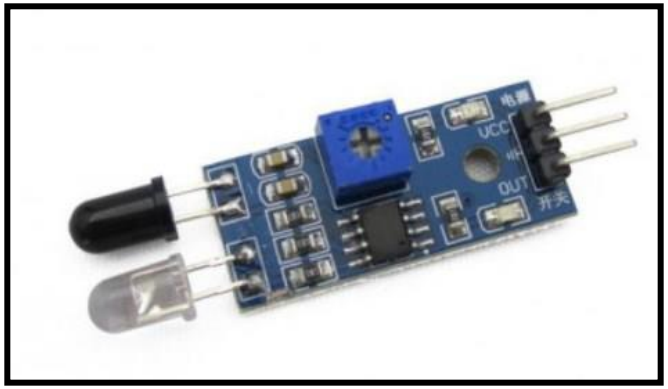




Arduino UNO



LCD Display



IR Sensor

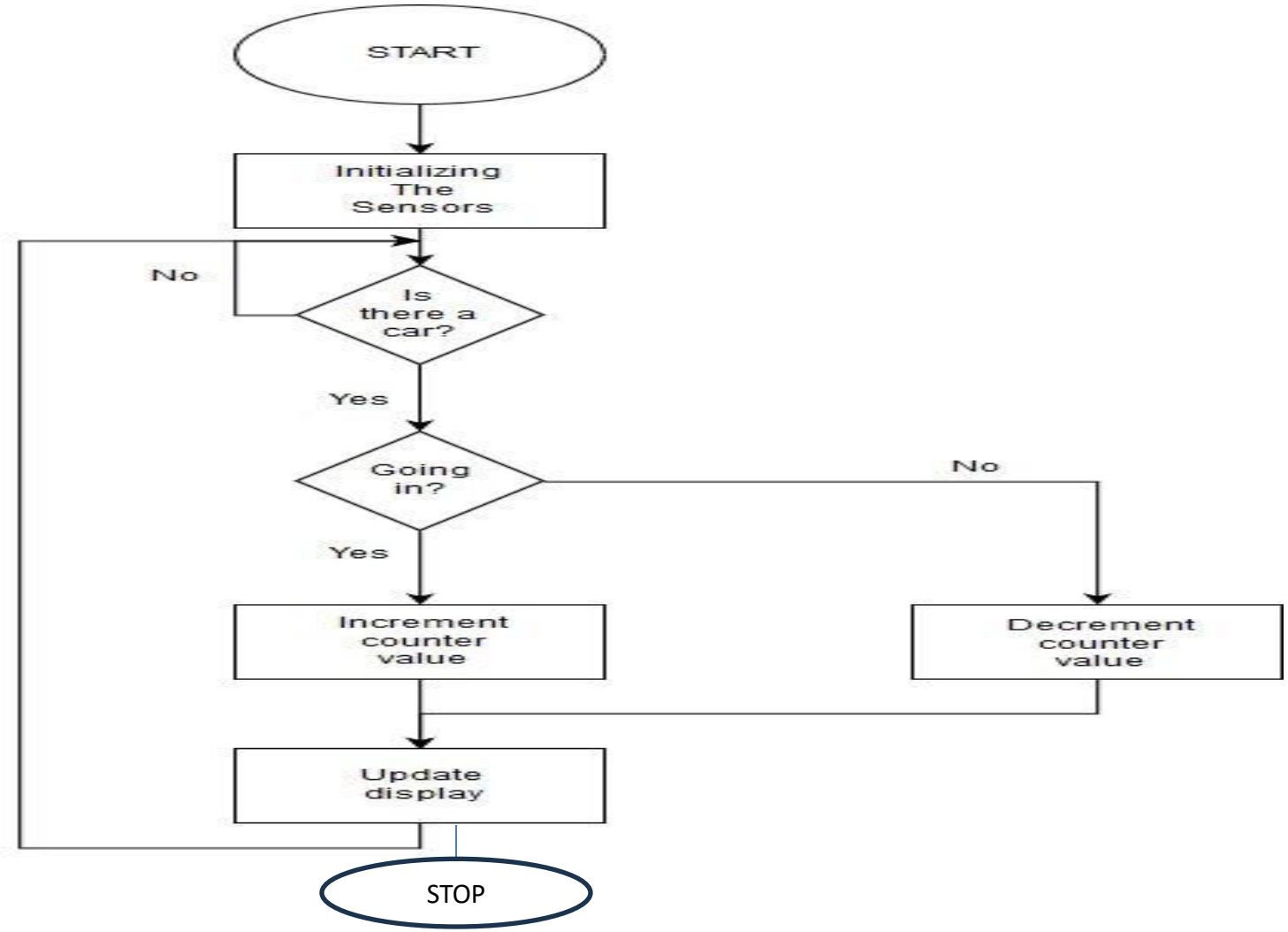
Connecting wires

Servo motor

COMPONENTS

- **Arduino uno:**
  - Serves as the central processing unit of the system.
  - Processes data from sensors and executes programmed algorithms.
  - Controls the operation of other components based on input data.
- **LCD Display:**
  - Provides visual feedback to the driver.
- **IR Sensors:**
  - Mounted in parking spaces to detect empty slots
  - used at entry and exit gate to detect the car.
- **Servo Motor:**
  - Opens a gate for a car to pass through
  - designed to move to a given angular position

Design Flow:


START
Initializing The Sensors
No
Is there a car?
Yes
Going in?
No
Yes
Increment counter value
Decrement counter value
Update display
STOP

RESULTS :

- It guarantees snappy and computerized parking and simple recovery of vehicles.
- Up to 4 cars can be effectively and securely parked in the outlined model.
- The surface space required is identical to the parking spot of four cars as it were.
- Most reasonable for parking in workplaces, shopping centers and comparable spots.
- Low support levels are required by the framework.
- Sensors utilized have high affectability and are anything but difficult to deal with.
- Minimal effort framework, giving most extreme computerization.

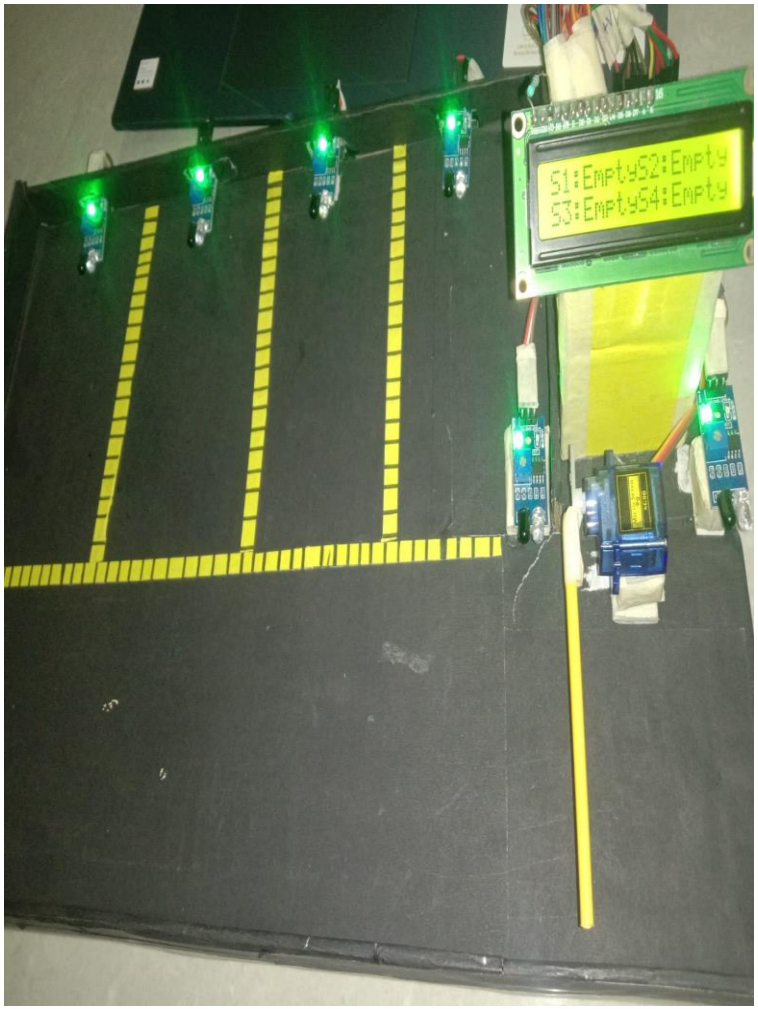


Figure 2: Outlook of Parking System

Advantages:

- Shorter waiting time at parking place.
- It saves fuel, money, space and time.
- Reduced pollution.
- Reduced traffic.
- Carbon emission is reduced.
- Efficiency

Applications:

The smart car parking system can be implemented in

- Shopping malls
- Restaurants
- Movie Theatres
- Parking management

Conclusion

Our project detects the empty slots and helps the drivers to find parking space in unfamiliar city. The average waiting time of users for parking their vehicles is effectively reduced in this system .It effectively satisfy the needs and requirements of existing car. It also eliminates unnecessary travelling of vehicles across the filled parking slots in a city

References

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Thank you!