

A Project Report

On

SMART PARKING SOLUTION

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CERTIFICATE

This is to certify that Mr. SHOHRAT ALI of

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SMART PARKING SOLUTION

in partial fulfillment of requirement for the award of **MCA** prescribed by the MIT World Peace

University, Pune, from 2018 to 2021

This project is the record of authentic work carried out by him / her out during the academic year

2019

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DECLARATION

I, Mr. PUSHKAR PARMAR hereby declare that this project is the record of authentic work carried out by me during the academic year 2019. This project is plagiarism free and has not been submitted to any other University or Institute towards the award of any degree.

Signature of the student

(PUSHKAR PARMAR)

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1. INTRODUCTION

1.1 Existing System

Throughout the decades our nation has been grown definitely, presently we are in this express we have a great deal of very much reached streets, business fabricating and expanding number of vehicles. While stopping these vehicles in parking spot we utilize the manual methodology of leaving. Which the greater part of the cases is spontaneous and absence of control because of this, individuals can leave their vehicles anyplace they need to, which makes a wreck as individuals don't pursue the specific signal more often than not. Therefore, a colossal congested driving conditions happens in that spot. While leaving in and recovering vehicle due fumble autos can get gouge by knocking with one another as there is absence of adequate space. This prompts contentions, battles among individuals which in some cases makes tremendous congested driving conditions. This is additionally an efficient misfortune as we have to fix our harmed vehicle and furthermore autos expend additional fuel while leaving in or out. Automobile overload is an issue here as it kills our valuable time. Because of this disarray in stopping our important time gets squandered. It hurts the understudies, office going staffs and crisis patients as it were.

1.2 Need of New System

New system is needed as it causes economical loss to commercial places like shopping malls, amusement parks, as people are more likely not to visit these places due to this parking hazard. As we are advancing with time, the manual car parking system in commercial spaces is creating hurdle which is causing wastage of time and some economic losses as well. Therefore, we need a solution which can overcome these problems. Here we are introducing Smart Parking as a solution of these problems as well as a replacement to the manual car parking systems at commercial spaces. This system not only saves time and money, it can also earn money by charging for parking spaces.

2. Proposed System

2.1 Proposed System

Smart Parking Solutions Using Arduino UNO Designing, making and conveying a primary edge halting advancement is called as Smart halting. It is a vehicle halting structure that assists drivers with finding an unfilled spot. Using the IR sensors in each halting space, it distinguishes the closeness or nonattendance of a vehicle. Splendid Parking structure is exhibited as a right, solid and cost powerful way to deal with ensure that road customers know absolutely where void vehicle parking spaces are.

Moving towards smart city, smart parking is a very good example for a common citizen of how the Internet-of-Things (IoT) can be efficiently and effectively used in our day to day life to provide different services to different users. Proposed system provides well-organized car parking management through isolated parking spot localization. Proposed smart parking system providing the free parking slot efficiently that saves time and fuel and reduces atmospheric pollution and congestion in cities. IOT based new Parking platform enable to connect, analyse and automate data gathered from devices, and execute efficiently that makes smart parking possible.

2.2 Objective

1. Introducing automatic vehicle parking system in Bangladesh and get benefited by it.
2. To compare various aspects of this manual parking system with the automated parking system.
3. To find out the economic benefits of introducing automated vehicle system.
4. Parking space reservation can help drivers to reduce the search time dramatically.
5. It reduces time in search of vacant parking spaces is reduced so it reduces traffic congestion caused due that.
6. Enhance the security with simplifying parking system.
7. Smart system that parks a number of vehicles with the least space possible.
8. To create the garage energy efficient by using efficient management.

2.3 Requirements of System

Software Requirements	<ol style="list-style-type: none">1. Arduino IDE2. Windows 8 and higher
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Hardware Requirements

1. Arduino Uno



2. Infrared Sensor



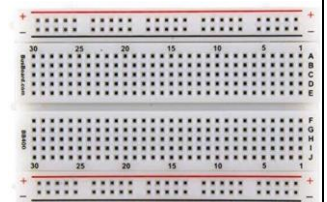
3. Jumper Wire



4. Servo Motor



5. Breadboard



6. LCD

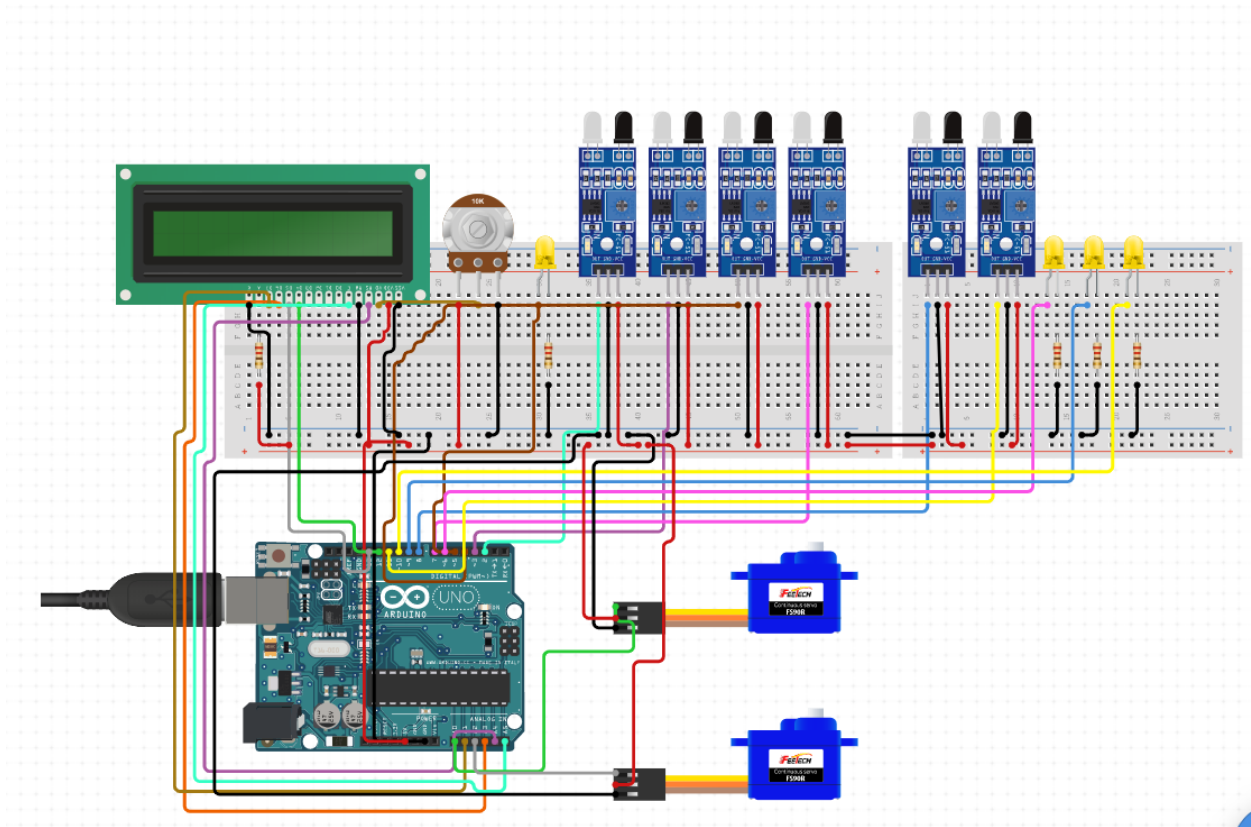


7. LED

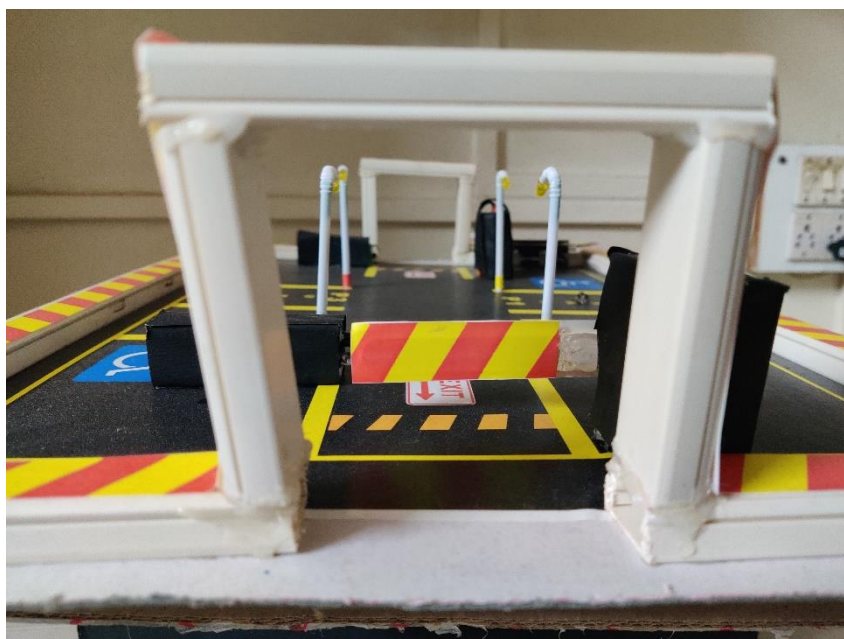


3 Analysis and Design

3.1 Circuit Diagram

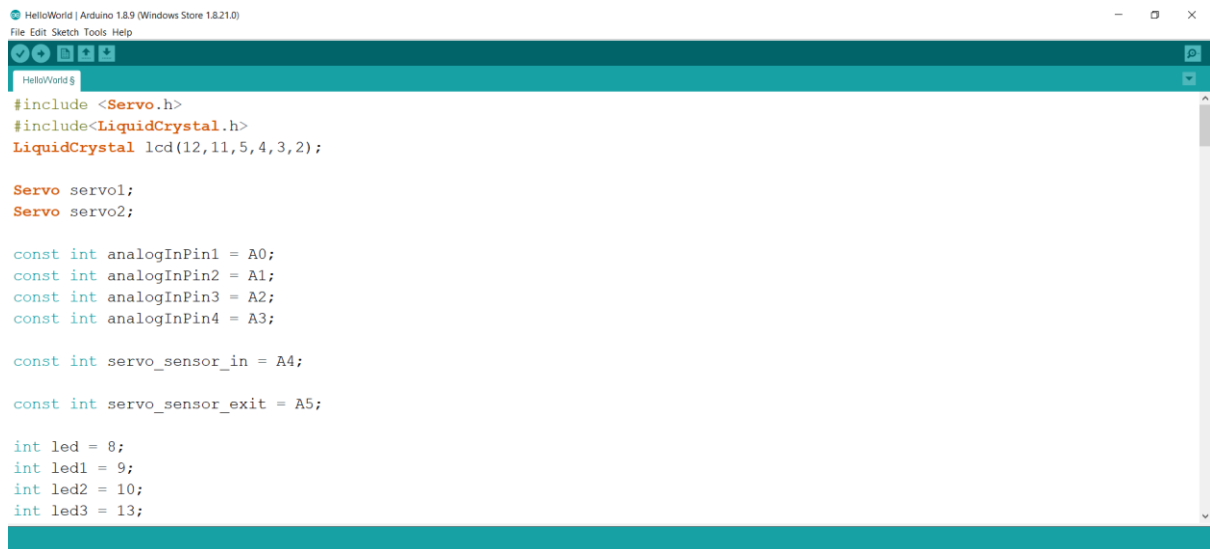


3.2 Screenshots





4 Code



The screenshot shows the Arduino IDE interface with a file named 'HelloWorld.s' open. The code includes headers for Servo and LiquidCrystal, defines pins for servos and LEDs, and sets up servo sensors.

```
HelloWorld.s
#include <Servo.h>
#include<LiquidCrystal.h>
LiquidCrystal lcd(12,11,5,4,3,2);

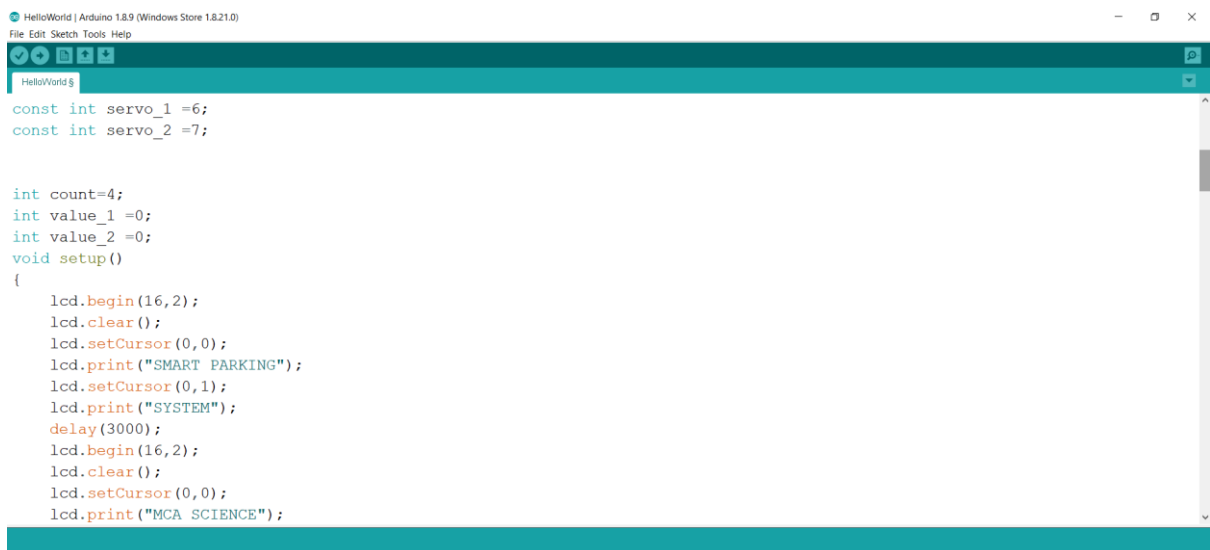
Servo servol;
Servo servo2;

const int analogInPin1 = A0;
const int analogInPin2 = A1;
const int analogInPin3 = A2;
const int analogInPin4 = A3;

const int servo_sensor_in = A4;

const int servo_sensor_exit = A5;

int led = 8;
int led1 = 9;
int led2 = 10;
int led3 = 13;
```



The screenshot shows the Arduino IDE interface with a file named 'HelloWorld.s' open. The code defines servo pins, initializes a count and values, and sets up the LCD display to show 'SMART PARKING' and 'SYSTEM' messages.

```
HelloWorld.s
const int servo_1 =6;
const int servo_2 =7;

int count=4;
int value_1 =0;
int value_2 =0;
void setup()
{
    lcd.begin(16,2);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("SMART PARKING");
    lcd.setCursor(0,1);
    lcd.print("SYSTEM");
    delay(3000);
    lcd.begin(16,2);
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("MCA SCIENCE");
```

```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld $
pinMode (led2,OUTPUT);
pinMode (led3,OUTPUT);

}

void loop()
{
  value_1 = analogRead(servo_sensor_in);
  value_2 = analogRead(servo_sensor_exit);

  // servo 1 Entry Gate code //

  {
    if(count >=1 && analogRead(A4)<500 )
    {
      servol.write(90);
      delay(1000);
      count--;
      lcd.clear();
      lcd.setCursor(0,0);
    }
  }
```

```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld $
lcd.setCursor(0,1);
lcd.print("MINI PROJECT");
lcd.setCursor(0,0);
delay(3000);
lcd.begin(16,2);
lcd.print("MENTOR");
lcd.setCursor(0,1);
lcd.print("DR C H PATIL");
delay(3000);

lcd.clear();
lcd.setCursor(0,0);
lcd.print("AVAILABLE");
lcd.setCursor(0,1);
lcd.print("SLOTS");
```

```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld $
lcd.print("AVAILABLE");
lcd.setCursor(0,1);
lcd.print("SLOTS");
delay(1000);
lcd.setCursor(6,6);
lcd.print(count);
}
else if(count==0 && analogRead(A4)<500)
{
  servol.write(0);
  delay(1000);
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("PARKING");
  lcd.setCursor(0,1);
  lcd.print("FULL");
  delay(1000);
}
else
{
}
```

```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld.g
delay(1000);
lcd.setCursor(6,6);
lcd.print(count);

pinMode (analogInPin1, INPUT);
pinMode (analogInPin2, INPUT);
pinMode (analogInPin3, INPUT);
pinMode (analogInPin4, INPUT);

pinMode(servo_sensor_in, INPUT);
pinMode(servo_sensor_exit, INPUT);

servo1.attach(servo_1);
servo2.attach(servo_2);

pinMode (led, OUTPUT);
pinMode (led1, OUTPUT);
```

```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld.g
servo1.write(0);
delay(60);
}

// servo 2 Exit Gate code //
{
  if(count < 4 && analogRead(A5)<500 )
  {
    servo2.write(90);
    delay(1000);
    count++;
    lcd.clear();
    lcd.setCursor(0,0);
    lcd.print("AVAILABLE");
    lcd.setCursor(0,1);
    lcd.print("SLOTS");
    delay(1000);
    lcd.setCursor(6,6);
```



```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld.g
lcd.setCursor(6,6);
lcd.print(count);
}
else
{
    servo2.write(0);
    delay(60);
}
}

// Parking Slot 1 IR & Led
if (analogRead(A0)<500) // if the IR sensor value is < 500 then the motor will start rotating
{
    digitalWrite(led, HIGH);
}

else if (analogRead(A0)>500) // if the IR sensor value is < 500 then the motor will start rotating
{
    digitalWrite(led, LOW);
}
```

```
HelloWorld | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help

HelloWorld.g
if (analogRead(A1)<500) // if the IR sensor value is < 500 then the motor will start rotating
{
    digitalWrite(led1, HIGH);
}

else if (analogRead(A1)>500) // if the IR sensor value is < 500 then the motor will start rotating
{
    digitalWrite(led1, LOW);
}

// Parking Slot 3 IR & Led
if (analogRead(A2)<500) // if the IR sensor value is < 500 then the motor will start rotating
{
    digitalWrite(led2, HIGH);
}

else if (analogRead(A2)>500) // if the IR sensor value is < 500 then the motor will start rotating
{
    digitalWrite(led2, LOW);
}
```



HelloWorld.s

```
        digitalWrite(led2, HIGH);
    }

    else if (analogRead(A2)>500) // if the IR sensor value is < 500 then the motor will start rotating
    {
        digitalWrite(led2, LOW);
    }

    // Parking Slot 4 IR & Led
    if (analogRead(A3)<500) // if the IR sensor value is < 500 then the motor will start rotating
    {
        digitalWrite(led3, HIGH);
    }

    else if (analogRead(A3)>500) // if the IR sensor value is < 500 then the motor will start rotating
    {
        digitalWrite(led3, LOW);
    }
}
```

5 Testing

5.1 Test Cases

1. First we tried code for testing IR sensor whether it's detecting objects or not.
2. Then we tried to fix the
3. We tried test the servo motor but there were some errors in code, we fixed the code and tried again and it worked.
4. Then we tried to combine IR sensor code and motor code for entry and exit gate and parking lot.
5. We attached LCD for showing empty spots.
6. We tried code for LCD and it took some to solve errors.
7. Combined all the code and tested each and every thing but found errors again.
8. Then error was solved and we made model.
9. Attached wires to Arduino uno and attached sensor and servo motor.
10. At last all errors were solved and model was working good.

6 Conclusion

6.1 Limitations and Drawbacks

1. While parking is empty it doesn't show exactly which slot is empty.
2. There is no app for pre booking the parking slot.
3. Our system don't keep record of the driver who parked the car.
4. There is no database or system to record car number.

6.2 Future Enhancement

1. We will make app for facial recognition and Number Plate Recognition.
2. We will keep the record of driver.
3. There will be display of vacant slots.

6.3 Conclusion

This project focuses on implementation of car parking place detection using Internet of Things.

The system benefits of smart parking go well beyond avoiding time wasting.

Developing a smart parking solutions with in a city solves the pollution problem.

7 Bibliography

<https://www.circuito.io/>

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<https://www.google.co.in>