Smart parking system project

**Anna University college code - 4130**

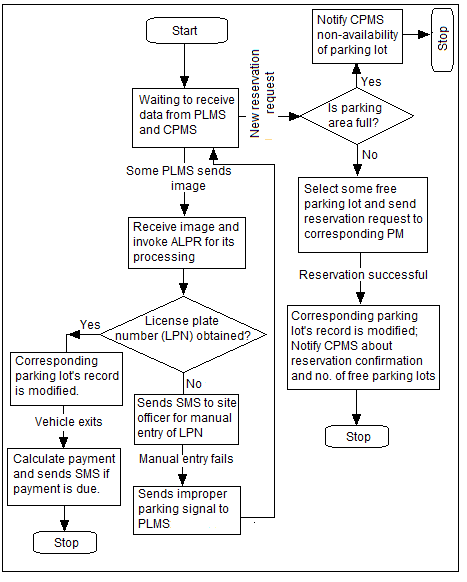
**Computer Science and Engineering**

abstract

This project deals with an effective way of finding empty spaces and managing the number of vehicles moving in and out in complex multi storeyed parking structures by detecting a vehicle using IR sensors and thus providing a feedback.

 In rapidly expanding environment where vehicle is an essential commodity, finding vehicle parking slot now-a-days-becoming one of the key concerning issues in our day to day life and is often causing traffic congestion during the peak hours as the vehicle density is more.

The design and implementation of a smart-parking system



smart parking system:

In a nutshell, Smart Parking is a parking solution that can include in-ground Smart Parking sensors, cameras or counting sensors. These devices are usually embedded into parking spots or positioned

next to them to detect whether parking bays are free or occupied.

**Attributes:**

1. **Real-Time Parking Availability:**

One of the cornerstones of a smart parking

management system is real-time information about available parking spaces. Through sensors placed strategically throughout parking lots or garages, the system can detect whether a parking spot is vacant or occupied. This information is then relayed to users in real-time through mobile applications or digital displays, allowing them to quickly locate an available spot.

1. **Mobile App Integration:**

gateway to the smart parking experience. The app providA user-friendly mobile application acts as the es users with a wealth of information, from real-time parking availability to directions to the nearest open spot. Users

can reserve and pay for parking spaces directly through the app, making the process seamless and convenient.

# Reservation and Pre-Booking:

The ability to reserve a parking spot in advance is a

valuable feature of smart parking systems. Always use a smart Security System supplier for access control. Users can secure a parking space before arriving at their

destination, ensuring they have a guaranteed spot and minimizing the time spent searching for parking upon arrival.

# 9. Security and Monitoring

Security is a paramount concern for parking facilities. Smart parking systems often include surveillance cameras and monitoring capabilities to enhance security.

Administrators can monitor the facility in real-time and respond to any incidents promptly.

The features of a smart parking management system redefine the parking experience by integrating technology, data, and convenience. As cities evolve into smart urban environments, these systems become a critical component of efficient mobility solutions.

Incorporating real-time information, mobile app

integration, reservation options, contactless payments,

data analytics, and more, these systems not only make parking hassle-free for users but also empower city planners to optimize urban spaces and reduce environmental impact. The result is a win-win situation— users enjoy a seamless parking experience, and cities benefit from reduced congestion, improved traffic management, and a greener footprint.

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| 1.40222E+11 | 6.02202E+12 | 2 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 10 |
| 6.02202E+12 | rcpt\_06022018095808 | 150 |
| 6.02202E+12 | rcpt\_06022018095802 | 50 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 10 |
| 6.02202E+12 | rcpt\_06022018095802 | 50 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | 6.02202E+12 | 5 |
| 6.02202E+12 | 6.02202E+12 | 10 |
| 6.02202E+12 | 6.02202E+12 | 0 |
| 6.02202E+12 | 6.02202E+12 | 9 |
| 6.02202E+12 | 6.02202E+12 | 4 |
| 1.4022E+11 | 1.4022E+13 | 30 |
| 1.4022E+11 | 1.4022E+13 | 10 |

|  |  |  |
| --- | --- | --- |
| 6.02202E+12 | 6.02202E+12 | 5 |

|  |  |  |
| --- | --- | --- |
| 6.02202E+12 | 6.02202E+12 | 5 |
| 6.02202E+12 | 6.02202E+12 | 1 |
| 6.02202E+12 | 6.02202E+12 | 1 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 1.40222E+11 | 1.4022E+13 | 10 |
| 1.40222E+11 | 6.02202E+12 | 10 |
| 1.40222E+11 | 6.02202E+12 | 2 |
| 6.02202E+12 | 1.4022E+13 | 10 |
| 6.02202E+12 | 1.4022E+13 | 4 |
| 6.02202E+12 | 1.4022E+13 | 10 |
| 6.02202E+12 | 1.4022E+13 | 50 |
| 6.02202E+12 | 1.4022E+13 | 15 |
| 6.02202E+12 | 6.02202E+12 | 20 |
| 6.02202E+12 | 6.02202E+12 | 4 |
| 6.02202E+12 | 1.4022E+13 | 15 |
| 6.02202E+12 | 1.4022E+13 | 10 |
| 1.4022E+11 | 6.02202E+12 | 0 |
| 1.40222E+11 | 6.02202E+12 | 2 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 10 |
| 6.02202E+12 | rcpt\_06022018095808 | 150 |
| 6.02202E+12 | rcpt\_06022018095802 | 50 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 10 |
| 6.02202E+12 | rcpt\_06022018095802 | 50 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | 6.02202E+12 | 5 |
| 6.02202E+12 | 6.02202E+12 | 10 |
| 6.02202E+12 | 6.02202E+12 | 0 |
| 6.02202E+12 | 6.02202E+12 | 9 |
| 6.02202E+12 | 6.02202E+12 | 4 |
| 1.4022E+11 | 1.4022E+13 | 30 |
| 1.4022E+11 | 1.4022E+13 | 10 |
| 6.02202E+12 | 6.02202E+12 | 5 |
| 6.02202E+12 | 6.02202E+12 | 5 |
| 6.02202E+12 | 6.02202E+12 | 1 |
| 6.02202E+12 | 6.02202E+12 | 1 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 6.02202E+12 | rcpt\_AP 31 HY 1235 | 20 |
| 1.40222E+11 | 1.4022E+13 | 10 |
| 1.40222E+11 | 6.02202E+12 | 10 |
| 1.40222E+11 | 6.02202E+12 | 2 |
| 1.40222E+11 | 1.4022E+13 | 10 |

|  |  |  |
| --- | --- | --- |
| 1.40222E+11 | 1.4022E+13 | 4 |

**Payment\_ID Car number**

payid\_AP 31 HY 1235 AP31HY1235

payid\_AP 31 HY 1235 AP31HY1235

payid\_AP 31 HY 1235 AP31HY1235

payid\_06022018095803 AP53UP3135

payid\_06022018095802 AP53UP3141

payid\_AP 31 HY 1235 AP31HY1235

payid\_06022018095802 AP53UP3131

payid\_AP 31 HY 1235 AP31HY1235

payid\_AP 31 HY 1235 AP31HY1235 6.02202E+12 AP30CL4567

6.02202E+12 IND00UP1122

6.02202E+12 IND00UP1122

6.02202E+12 AP53UP3131

6.02202E+12 AP53UP3131

1.4022E+13 AP

1.4022E+13 AP

6.02202E+12 AP30CL4567

6.02202E+12 AP30CL4567

6.02202E+12 AP30CL4567

6.02202E+12 AP30CL4567 payid\_AP 31 HY 1235 AP31HY1235

payid\_AP 31 HY 1235 AP31HY1235 1.4022E+13 AP35AF4234

6.02202E+12 AP30CL4567

6.02202E+12 AP30CL4567

1.4022E+13 AP

1.4022E+13 IND00UP1122

1.4022E+13 IND00UP1122

1.4022E+13 AP35AF4234

1.4022E+13 AP35AF4234

6.02202E+12 IND00UP1122

6.02202E+12 AP53UP3131

1.4022E+13 AP35AF4234

1.4022E+13 AP35AF4234

6.02202E+12 IND00UP1122

6.02202E+12 AP30CL4567

payid\_AP 31 HY 1235

payid\_AP 31 HY 1235

payid\_AP 31 HY 1235 payid\_06022018095803

payid\_06022018095802 payid\_AP 31 HY 1235 payid\_06022018095802 payid\_AP 31 HY 1235

payid\_AP 31 HY 1235 6.02202E+12

6.02202E+12

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payid\_AP 31 HY 1235

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payid\_AP 31 HY 1235

payid\_AP 31 HY 1235

payid\_AP 31 HY 1235 payid\_06022018095803 payid\_06022018095802 payid\_AP 31 HY 1235 payid\_06022018095802 payid\_AP 31 HY 1235

payid\_AP 31 HY 1235 6.02202E+12

6.02202E+12

6.02202E+12

6.02202E+12

6.02202E+12

1.4022E+13

1.4022E+13

6.02202E+12

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6.02202E+12

payid\_AP 31 HY 1235

payid\_AP 31 HY 1235 1.4022E+13

6.02202E+12

6.02202E+12

1.4022E+13

1.4022E+13

**Smart parking**

**Description :**

**Smart parking solutions detect parking space availability in real-time, helping to optimize on-street parking in cities and in parking garages or surface parking lots such as those in shopping malls, train stations, corporate campuses, and more.**

**Program :**

#define ECHO\_PIN1 15 //Pins for Sensor 1

#define TRIG\_PIN1 2 //Pins for Sensor 1

#define ECHO\_PIN2 5    //Pins for Sensor 2

#define TRIG\_PIN2 18   //Pins for Sensor 2

#define ECHO\_PIN3 26  //Pins for Sensor 3

#define TRIG\_PIN3 27   //Pins for Sensor 3

int LEDPIN1 = 13;

int LEDPIN2 = 12;

int LEDPIN3 = 14;

void setup() {

**Serial**.begin(115200);

  pinMode(LEDPIN1, OUTPUT);

  pinMode(TRIG\_PIN1, OUTPUT);

  pinMode(ECHO\_PIN1, INPUT);

   pinMode(LEDPIN2, OUTPUT);

  pinMode(TRIG\_PIN2, OUTPUT);

  pinMode(ECHO\_PIN2, INPUT);

   pinMode(LEDPIN3, OUTPUT);

  pinMode(TRIG\_PIN3, OUTPUT);

  pinMode(ECHO\_PIN3, INPUT);

}

float readDistance1CM() {

  digitalWrite(TRIG\_PIN1, LOW);

  delayMicroseconds(2);

  digitalWrite(TRIG\_PIN1, HIGH);

  delayMicroseconds(10);

  digitalWrite(TRIG\_PIN1, LOW);

  int duration = pulseIn(ECHO\_PIN1, HIGH);

  return duration \* 0.034 /2 ;

}

float readDistance2CM() {

  digitalWrite(TRIG\_PIN2, LOW);

  delayMicroseconds(2);

  digitalWrite(TRIG\_PIN2, HIGH);

  delayMicroseconds(10);

  digitalWrite(TRIG\_PIN2, LOW);

  int duration = pulseIn(ECHO\_PIN2, HIGH);

  return duration \* 0.034 / 2;

}

float readDistance3CM() {

  digitalWrite(TRIG\_PIN3, LOW);

  delayMicroseconds(2);

  digitalWrite(TRIG\_PIN3, HIGH);

  delayMicroseconds(10);

  digitalWrite(TRIG\_PIN3, LOW);

  int duration = pulseIn(ECHO\_PIN3, HIGH);

  return duration \* 0.034 / 2;

}

void loop() {

  float distance1 = readDistance1CM();

  float distance2 = readDistance2CM();

  float distance3 = readDistance3CM();

  bool isNearby1 = distance1 > 200;

  digitalWrite(LEDPIN1, isNearby1);

  bool isNearby2 = distance2 > 200;

  digitalWrite(LEDPIN2, isNearby2);

  bool isNearby3 = distance3 > 200;

  digitalWrite(LEDPIN3, isNearby3);

**Serial**.print("Measured distance: ");

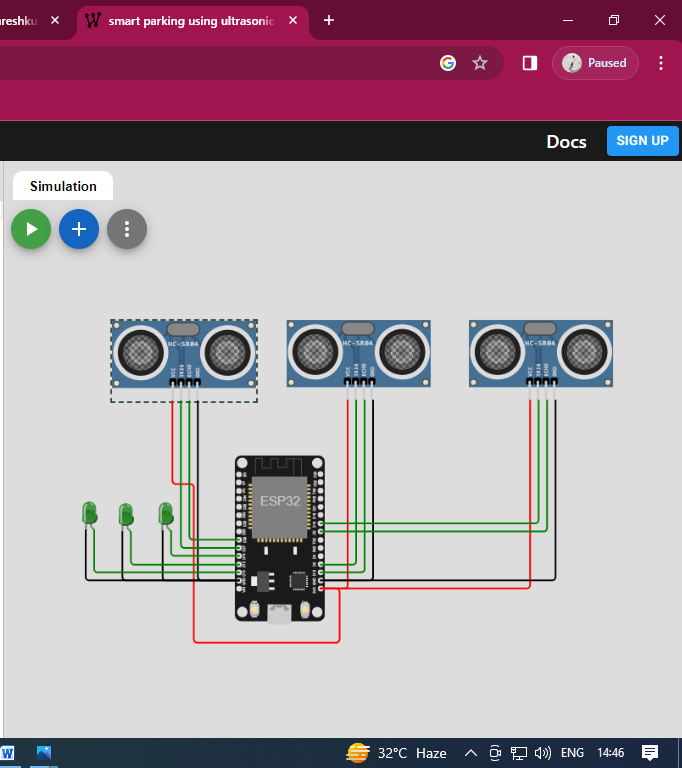
**Serial**.println(readDistance1CM());

**Serial**.println(readDistance2CM());

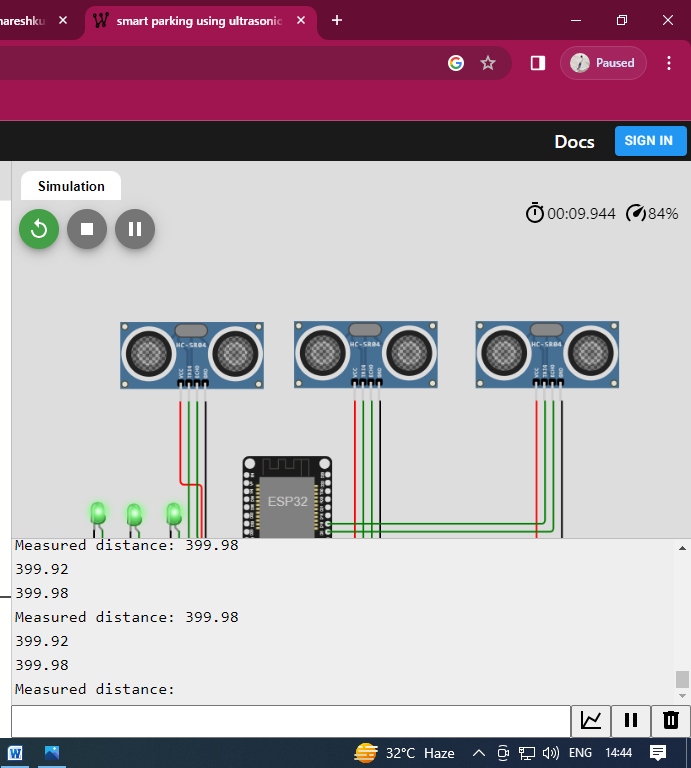
**Serial**.println(readDistance3CM());

  delay(100);

}

**Sensor :**

**Output :**

****