

## Design and Implementation of Car Parking Alarm System

**SUPERVISOR :**

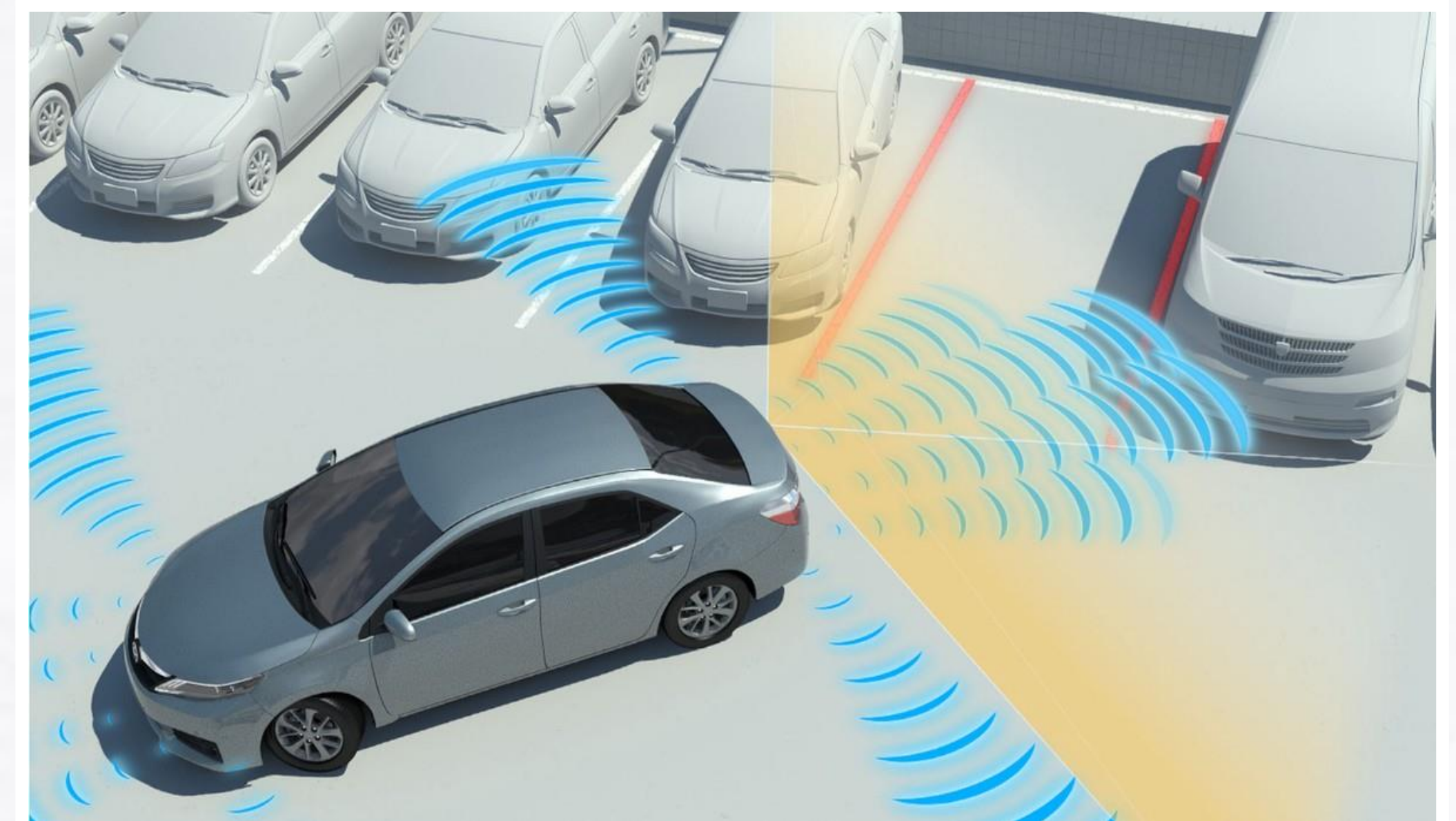
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### ABSTRACT :

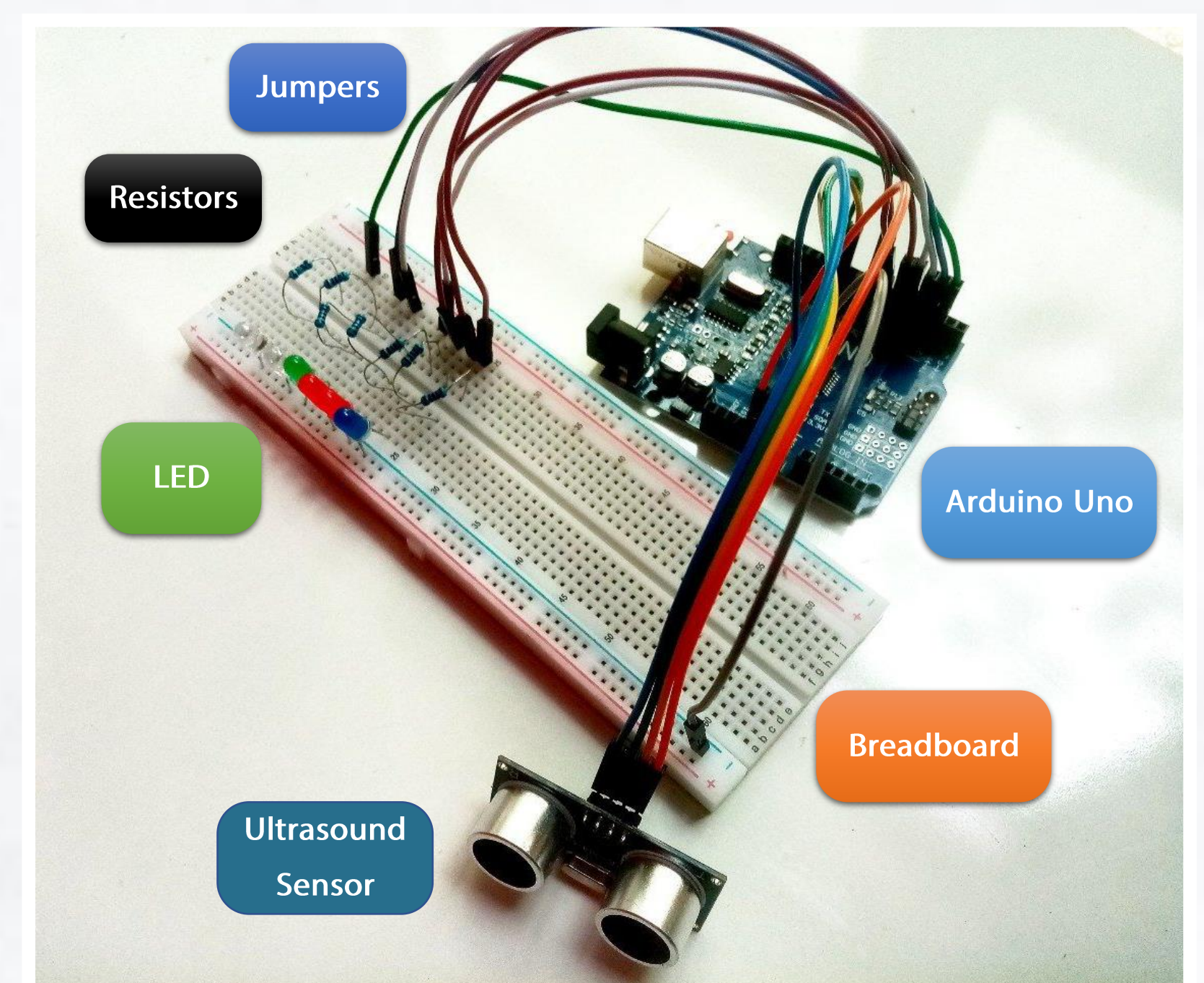
Sometimes it is difficult to park the car well, because of the driver's inaccuracy and the lack of assistive technology. This will lead to accidents. Arduino has provided a simple solution through which we can develop a technology that can help in car parking. Using a ultrasound sensor that senses objects near the car and gives an alert to the driver through colored lights.



### Operation :

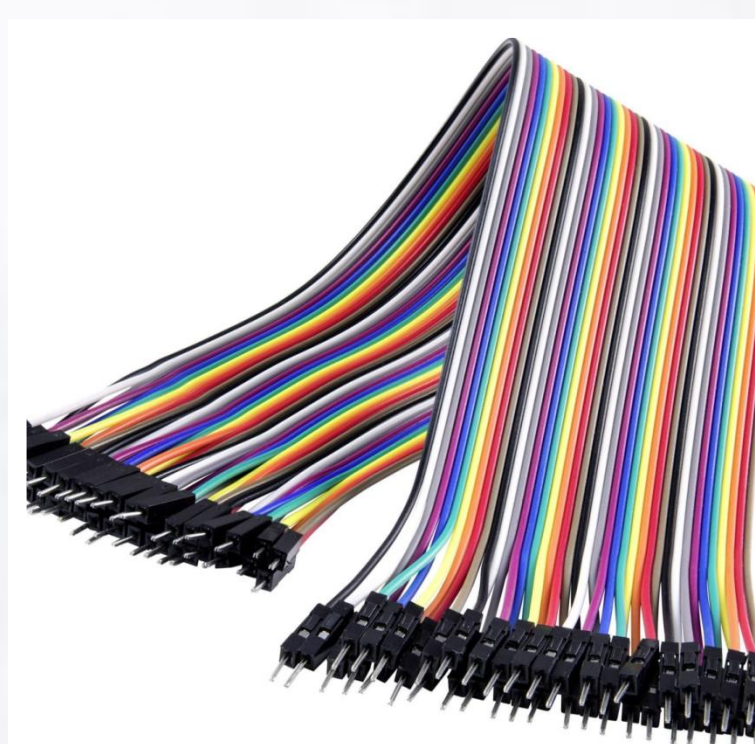
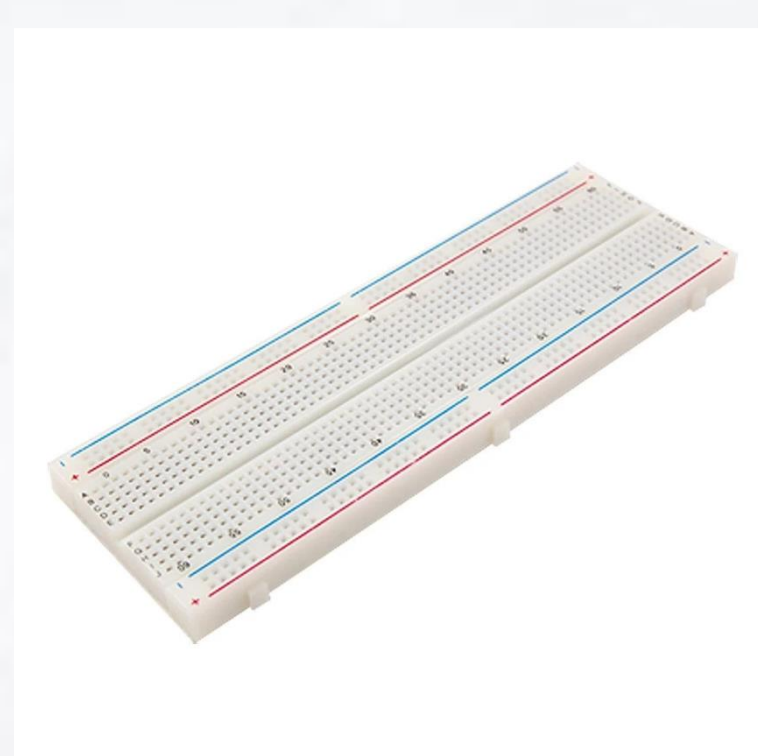
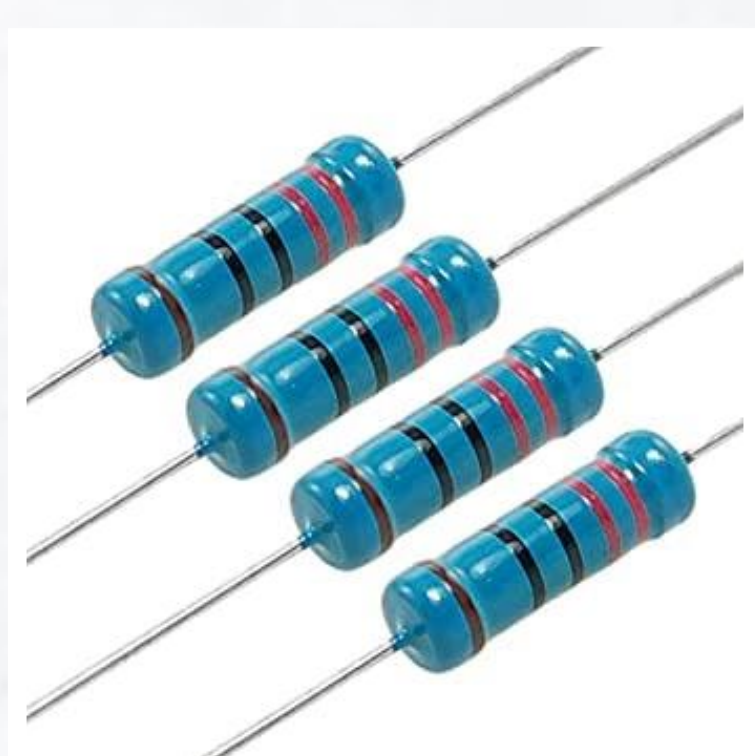
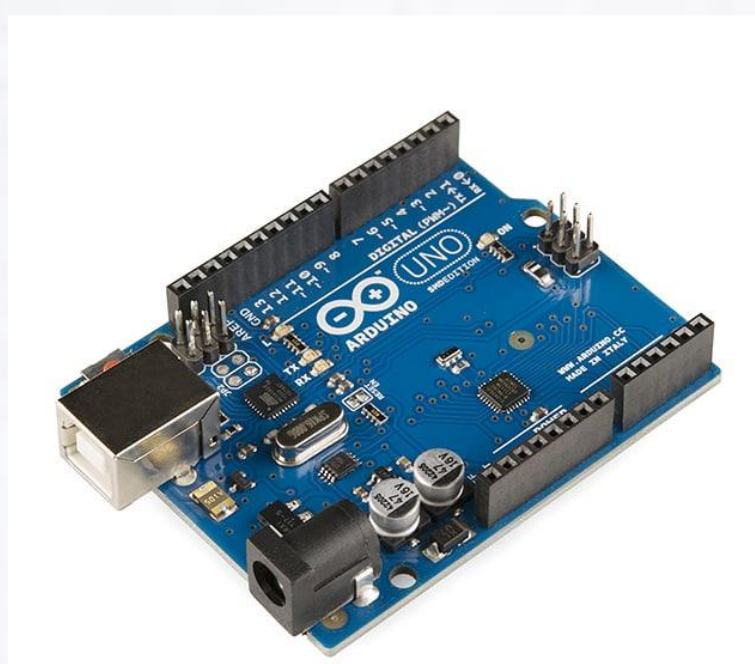
When the car approaches a certain object, such as a car, a wall, etc.; the ultrasound sensor in the back of the car gives a signal to the driver using LEDs located in front of the driver. Which is distinguished by their colors to give the distance between the car and the object behind it (each color indicates a certain distance). For example, the white color indicates that the vehicle is far away, the green color indicates that the vehicle is at an average distance, and the red color indicates that the car is 5 cm away from the body and the vehicle is almost involved in an accident.

A circuit as shown here was implemented to provide a safe parking. The code was uploaded to the Arduino IDE and the circuit functions well.



### Components :

1. Arduino uno
2. Breadboard
3. Ultrasonic sensor
4. Jumper cables
5. 1k ohm resistor (7)
6. LEDs (7)



### Programming Code :

```
const int trig = 11;
const int echo = 12;

const int LED1 = 2;
const int LED2 = 3;
const int LED3 = 4;
const int LED4 = 5;
const int LED5 = 6;
const int LED6 = 7;
const int LED7 = 8;

int duration = 0;
int distance = 0;

void setup()
{
  pinMode(trig , OUTPUT);
  pinMode(echo , INPUT);

  pinMode(LED1 , OUTPUT);
  pinMode(LED2 , OUTPUT);
  pinMode(LED3 , OUTPUT);
  pinMode(LED4 , OUTPUT);
  pinMode(LED5 , OUTPUT);
  pinMode(LED6 , OUTPUT);
  pinMode(LED7 , OUTPUT);
  .....etc.
```

### References :

1. Jerry Silver, 2009, 125 Physics Projects for the Evil Genius, 1st Ed., McGraw-Hill.
2. Hubert Henry Ward, 2022, Programming Arduino Projects with the PIC Microcontroller: A Line-by-Line Code Analysis and Complete Reference Guide for Embedded Programming in C, APress, USA.
3. Jeremy Blum, 2022, Exploring Arduino®: Tools and Techniques for Engineering Wizardry, (2nd Ed.), John Wiley & Sons, Inc. 10.1002/9781119405320.

### Circuit Diagram :

