

Smart Parking System Using IoT and Android App

In this phase, we are building a smart parking system using NodeMCU and ultrasonic sensors. Ultrasonic sensors are used to find distance ranges.

We will also show the live position of the parking slot on the Android app. For real-time data, we will use [Google Firebase](#). We will use [MIT App Inventor](#) to develop an Android app. The real-time database is used to show the live position of the parking slot in the Android app.

Component List

- NodeMCU
- Ultrasonic Sensors (acc. slots needed)
- Breadboard
- Jumper Wires

DEVELOPMENT CODE FOR SMART PARKING:

```
#include <ESP8266WiFi.h>

#include <FirebaseArduino.h>

#define FIREBASE_HOST "smart-parking-007.firebaseio.com" //Your Firebase Project URL goes here
without "http:" , "\" and "/"

#define FIREBASE_AUTH "hp4aQl2MtBZ9aZ8NmQwyRDtjhBCcupJYJmrEiHom" //Your Firebase
Database Secret goes here

#define WIFI_SSID "techzeero" //your WiFi SSID(Hotspot Name) for which your NodeMCU
connects

#define WIFI_PASSWORD "techzeero123" //Password of your wifi network

#define trigPin1 16 //D0 (We Used GPIO Pin Number)

#define echoPin1 5 //D1

#define trigPin2 4 //D2

#define echoPin2 0 //D3
```

```

#define trigPin3 2 //D4

#define echoPin3 14 //D5


void setup()
{
    Serial.begin(115200);    // Select the same baud rate if you want to see the datas on Serial
    Monitor

    pinMode(trigPin1, OUTPUT);
    pinMode(echoPin1, INPUT);
    pinMode(trigPin2, OUTPUT);
    pinMode(echoPin2, INPUT);
    pinMode(trigPin3, OUTPUT);
    pinMode(echoPin3, INPUT);


    WiFi.begin(WIFI_SSID,WIFI_PASSWORD);
    Serial.print("connecting");
    while (WiFi.status() != WL_CONNECTED)
    {
        Serial.print(".");
        delay(500);
    }
    Serial.println();
    Serial.print("connected:");
    Serial.println(WiFi.localIP());


    Firebase.begin(FIREBASE_HOST,FIREBASE_AUTH);
}


void firebaseconnect()
{
    Serial.println("Trying to reconnect");
}

```



```
    Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);  
}
```

```
void loop()  
{  
    if (Firebase.failed())  
    {  
        Serial.print("setting number failed:");  
        Serial.println(Firebase.error());  
        firebaseconnect();  
        return;  
    }  
}
```

```
//Ultrasonic Sensor 1
```

```
digitalWrite(trigPin1, LOW);  
delayMicroseconds(10);  
digitalWrite(trigPin1, HIGH);  
delayMicroseconds(10);  
digitalWrite(trigPin1, LOW);  
long duration1 = pulseIn(echoPin1, HIGH);  
long inch1 = duration1 / 74 / 2;    // In Inch
```

```
if(inch1 <=2)  
{  
    Firebase.setInt("U1",1);  
    Serial.println("U1 = 1");  
}  
else  
{  
    Firebase.setInt("U1",0);
```

```

    Serial.println("U1 = 0");
}

//Ultrasonic Sensor 2

digitalWrite(trigPin2, LOW);
delayMicroseconds(10);
digitalWrite(trigPin2, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin2, LOW);
long duration2 = pulseIn(echoPin2, HIGH);
long inch2 = duration2 / 74 / 2;    // In Inch

if(inch2 <=2)
{
    Firebase.setInt("U2",1);
    Serial.println("U2 = 1");
}
else
{
    Firebase.setInt("U2",0);
    Serial.println("U2 = 0");
}

//Ultrasonic Sensor 3

digitalWrite(trigPin3, LOW);
delayMicroseconds(10);
digitalWrite(trigPin3, HIGH);
delayMicroseconds(10);
digitalWrite(trigPin3, LOW);

```

```
long duration3 = pulseIn(echoPin3, HIGH);  
long inch3 = duration3 / 74 / 2;    // In Inch  
  
if(inch3 <=2)  
{  
    Firebase.setInt("U3",1);  
    Serial.println("U3 = 1");  
}  
else  
{  
    Firebase.setInt("U3",0);  
    Serial.println("U3 = 0");  
}  
}
```