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**KONERU LAKSHMAIAH EDUCATION FOUNDATION**

(Deemed to be university estd, u/s, 3 of the UGC Act, 1956)

(NAAC Accredited "A" Grade University)

**DEPARTMENT OF  
ELECTRONICS AND COMMUNICATION ENGINEERING**

**20EC2106-EMBEDDED CONTROLLERS & EMBEDDED  
SYSTEM DESIGN**

**LAB PROJECT REPORT**

**ACADEMIC YEAR :2021-2022 II**

**YEAR/III SEMESTER**

## **SMART CAR PARKING**

*Submitted by*

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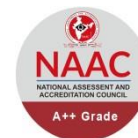
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(DST - FIST Sponsored Department)



**BONAFIDE CERTIFICATE**

This is to certify that this Project report titled **SMART CAR PARKING USING IOT** is the bonafide work of **K.Bhagya chandrika with Register No. 2000040081, S.Anudeep with Register No. 2000040184 , R.Kireeti with Register No.2000040196**, II Year / III Semester, under the guidance of < **PRABHAKARAN**>, Department of Electronics and Communication Engineering, in 19EC2016/Embedded Controllers & System Design Laboratory at Koneru Lakshmaiah Education Foundation in the year 2021-2022.

**Signature of the Faculty in charge**

**Signature of the HOD/ECE**

Submitted for the University Practical Examination held on.....

**INTERNAL EXAMINER**

**EXTERNAL EXAMINER**

## ABSTRACT:

This project is about parking the cars in smart way and saving the electric power and indication of vacancy in parking lot .

This project uses the Ultrasonic Sensor to detect nearby objects, and translates this information into motor motion in the Servo (the 'gate'). Assuming the role of the serial monitor in Arduino, the LCD screen displays the distance between the Ultrasonic Sensor and the nearby object, and describes the action the 'gate' is about to take. And also before entering into the gate we will arrange irsensor ,if the vehicle crosses that ir sensor it will detect the vehicle and turns the led on , and after the gate we place another ir sensor if the that ir sensor then led will be off . LED indication of parking lot occupance (RED-occupied, GREEN-free), LCD display at the entrance. Parking lot sensors are pointing straight down from the roof. For parking lot sensors we have used the same ir sensors for deteting the vehicles.

## INTRODUCTION

Now days finding parking in busy areas is very hard and there is no system to get the details of parking availability online. Imagine if you can get the parking slot availability information on your phone and you don't have roaming around to check the availability. This problem can be solved by the **IoT based smart parking system**. Using the IoT based parking system you can easily access the parking slot availability over the internet. This system can completely automate the car parking system. From your entry to the payment and exit all can be done automatically.

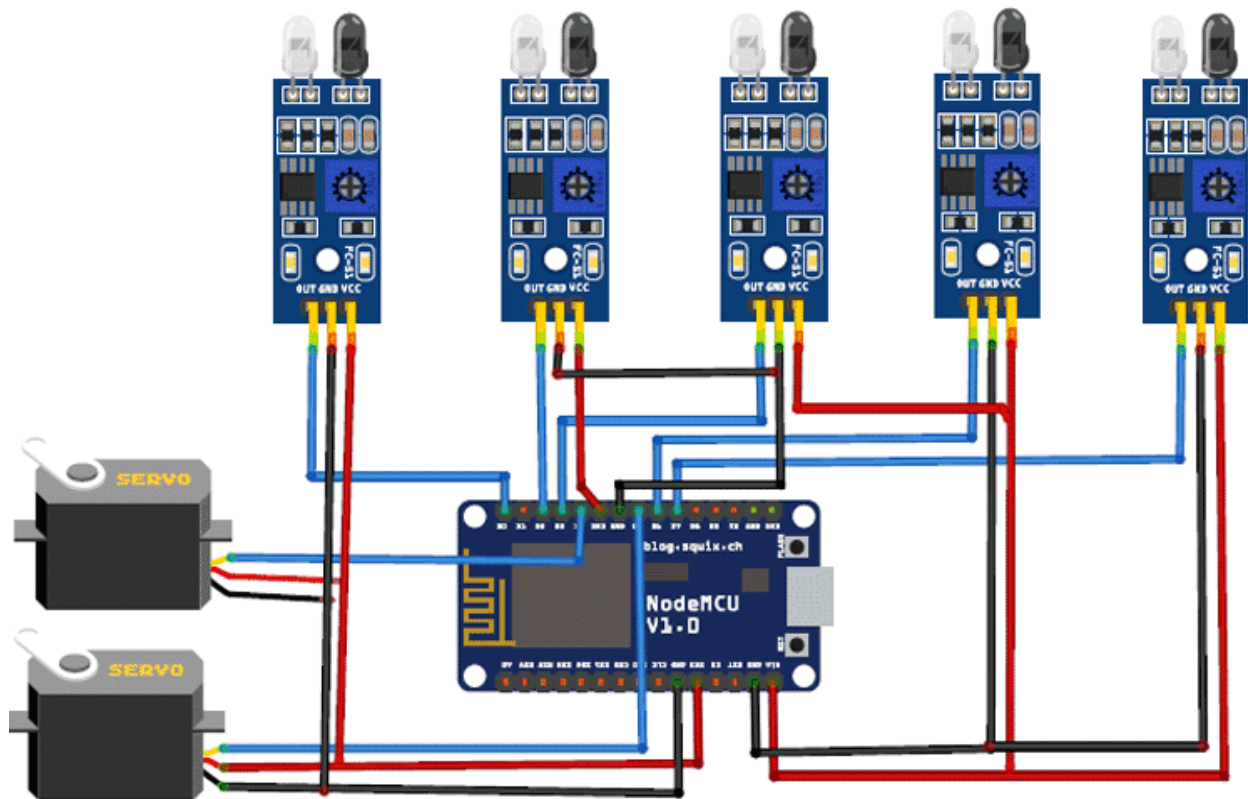
So here we are building an **IOT based Car Parking System** using NodeMCU, five IR sensors, and two servo motors. Two IR sensors are used at entry and exit gate to detect the car while three IR sensors are used to detect the parking slot availability. Servo motors are used to open and close the gates according to the sensor value. Here we are using the Arduino IOT Cloud platform to show publish the data on cloud which can be monitored from anywhere in the world.

Two servo motors are used as entry and exit gate, so whenever the IR sensor detects a car, the servo motor automatically rotates from 45° to 140°, and after a delay, it will return to its initial position. Another three IR sensors are used to detect if the parking slot is available or occupied and send the data to NodeMCU. Arduino IOT Cloud dashboard also has two buttons to manually operate the entry and exit gate

**TOPIC:** To design a system that opens the gate door and turning off and on the lights by detecting the vehicles and also indicates the vacancy in car parking.

**COMPONENTS REQUIRED:**

- Ultrasonic sensor
- Servomotor
- Lcd display
- Arduino uno
- IR sensors
- Green and red Leds



## CODE:

```
#include "thingProperties.h"
#include <Servo.h>
Servo servo;

Servo ravi;
int a,b,c;

void setup() {
  // Initialize serial and wait for port to open:
  Serial.begin(9600);
  pinMode(D0,INPUT);
  pinMode(D1,INPUT);
  pinMode(D2,INPUT);
  pinMode(D3,INPUT);
  pinMode(D4,INPUT);

  servo.attach(D5);
  ravi.attach(D6);
  servo.write(0);
  ravi.write(0);

  // This delay gives the chance to wait for a Serial Monitor without blocking if none is found
  delay(1500);

  // Defined in thingProperties.h
  initProperties();

  // Connect to Arduino IoT Cloud
  ArduinoCloud.begin(ArduinoIoTPreferredConnection);

  /*
   The following function allows you to obtain more information
   related to the state of network and IoT Cloud connection and errors
   the higher number the more granular information you'll get.
   The default is 0 (only errors).
   Maximum is 4
  */
  setDebugMessageLevel(2);
  ArduinoCloud.printDebugInfo();
}

void loop() {
  ArduinoCloud.update();
  // Your code here
```

```
    if(digitalRead(D0)==0)
    {
        servo.write(90);

    }
    else
    {
        servo.write(0);
    }

    if(digitalRead(D1)==1)
    {
        a=1;
    }
    else
    {
        a=0;
    }
    if(digitalRead(D2)==1)
    {
        b=1;
    }
    else
    {
        b=0;
    }

    if(digitalRead(D3)==1)
    {
        c=1;
    }
    else
    {
        c=0;
    }

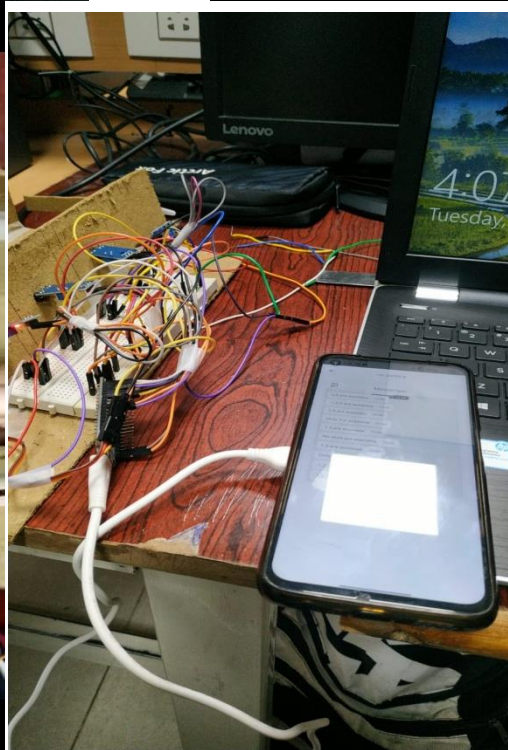
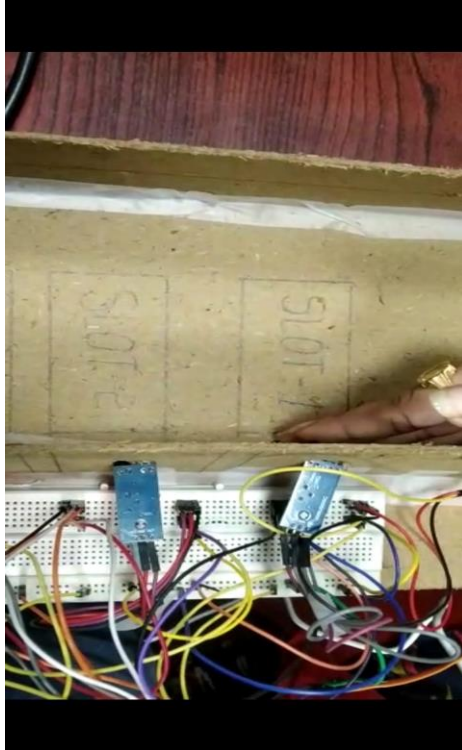
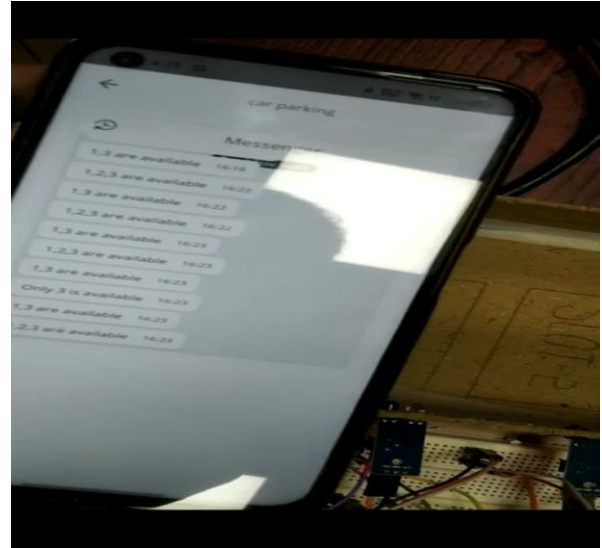
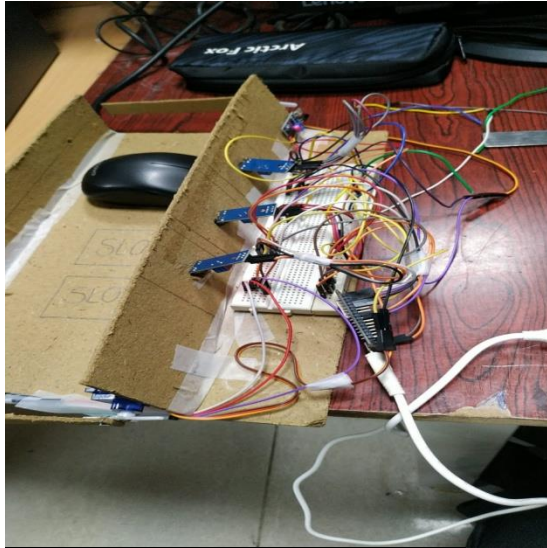
    if(digitalRead(D4)==0)
    {
        ravi.write(90);

    }
    else
    {
        ravi.write(0);

    }
    msg_change();
}
```

```
void msg_change()
{
    if(a==1 && b==1 && c==1)
    {
        msg=" 1,2,3 are available";
    }
    else if(a==1 && b==1 && c==0)
    {
        msg="1,2 are available";
    }
    else if(a==1 && b==0 && c==1)
    {
        msg="1,3 are available";
    }
    else if(a==1 && b==0 && c==0)
    {
        msg="Only 1 is available";
    }
    else if(a==0 && b==1 && c==1)
    {
        msg="2,3 are available";
    }
    else if(a==0 && b==1 && c==0)
    {
        msg="Only 2 is available";
    }
    else if(a==0 && b==0 && c==1)
    {
        msg="Only 3 is available";
    }
    else
    {
        msg="No slots are available";
    }
}
```

## RESULT & CONCLUSION:





So this is how a **Smart Parking System using IoT** can be built. You can add more sensors to increase the parking slots and can also add a payment system to automatically pay the parking fee .This system is to ease the drivers to find parking slots during peak hours by using Android Application. This is an efficient system as it helps to solve heavy traffic congestion and reduces the driver's frustrations.