

# **GNANAMANI COLLEGE OF TECHNOLOGY**

DEPARTMENT: BIO MEDICAL ENGINEERING

YEAR: THIRD YEAR

## **TOPIC: SMART PARKING**

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# SMART PARKING

## INTRODUCTION:

Smart parking is an IOT based parking system is a centralized management that enables drivers to such for and reserve a parking spot remotely through their smart phones .it offers a convenient arrangements for drivers to park their cars when they are looking to avoid potential traffic congestion.

## PROBLEM STATEMENT:

In recent research in metropolitan cities the parking management problem can be viewed from various angles such as high vehicle density on roads.

This result in annoying issues for the drivers to park their vehicles as it very difficult to find a parking slots.

The drivers usually waste time and effort in finding parking space and end up parking their vehicles a space on the street which further leads to space on congestion. In worst case, people fail to find any parking space especially during peak hours and festive season.

## HARDWARE USED IN SMART PARKING :

- Enode MCU (ESP8266)
- Jumper wires
- Infrared sensors
- 16\*2 Led display
- DC motor

## SOFTWARED USED IN SMART PARKING :

- ARDUINO IDE

## INITIAL SETUP :

The initial case of the system when we turn on our project, which indicates the number of vacant and filled spots on a 16\*2 display LCD and similarly on the blink app.

## PARKING VEHICLES :

Once when the user enters the parking detect sensor he would receive a parking slot number on his mobile application which he is supposed to park his vehicle. IR sensor successfully detecting the vehicle it shows a notification on the app the start time of the vehicle.

#### UNPARKING VEHICLES:

Unparking your vehicle from the parking slot would pop a notification on the application app starting the start time and end time user has parked the vehicle in the parking slot.

#### STEPS FOR PARKING :

Step 1: Install the smart parking application on your mobile device.

Step 2: On the 16\*2 display the number of vacant and filled spots are displayed so that the user can see the status of parking zone.

Step 3: Once the user logs into the app he would see the parking architecture with the cars filled at which position and positions which are empty .

Step 4: When the user is near to the parking IR detect sensor , he would receive a notification on his app on which slot he can park his vehicle if there is an empty slot.

Step 5: If there is no empty slot the user will be displayed with an appropriate message on the mobile application .

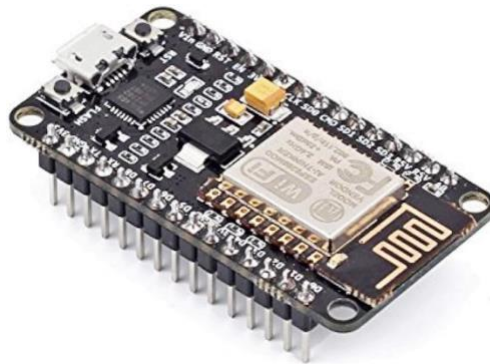
Step 6: On availability of parking area and user parking into the respective slot he/she would receive a message which states the start time of the parking and the slot in which he/she has parked.

Step 7: On successfully un-parking your vehicle from the parking slot the user will receive a message which states the start time and end time of his parking time and an amount which he needs to pay for the parking duration.

#### SYSTEM ANALYSIS AND DESIGN:

##### Node MCU :

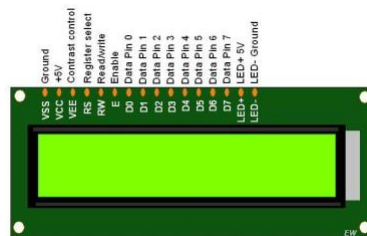
NodeMCU is capable of either connecting to an existing wireless connection or hosting an application over http protocol.



Node MCU module

### 16\*2 LCD Display

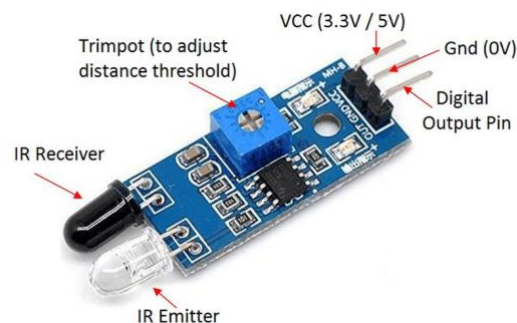
An LCD is an electronic display module which uses liquid crystal to produce a visible Image. The 16×2 LCD display is a very basic module commonly used in DIY's and Circuits. The 16×2 translates o a display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5×7 pixel matrix. The 16\*2 display is used to Display the number of vacant and spilled spot . It also gets updated on the display LCD when a vehicle parks or unparks the vehicle .



16\*2 LCD display

### IR SENSOR :

An infrared (IR) sensor is an electronic device that measures and detects infrared Radiation in its surrounding environment. Infrared radiation was accidentally Discovered by an astronomer named William Herchel in 1800. While measuring the Temperature of each color of light (separated by a prism), he noticed that the Temperature just beyond the red light was highest. IR is invisible to the human eye,



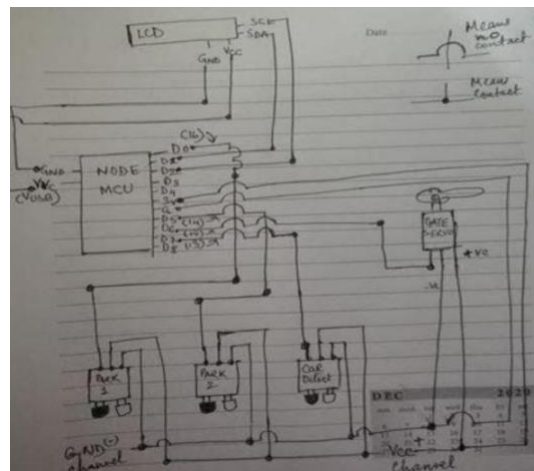
as Its wavelength is longer than that of visible light (though it is still on the same Electromagnetic spectrum).

## IR SENSOR

### OBJECTIVES OF SMART PARKING:

- Optimized parking.
- Reduced traffic.
- Reduced pollution.
- Increased Safety.
- Decreased Management Costs.
- Enhanced User Experience.

### CIRCUIT DIAGRAM:



### EXPERIMENTAL SETUP:



## CONCLUSION:

- The concept of smart cities has always been a dream for humanity . The growth of Internet of Things and cloud technologies have given rise to new possibilities in terms of smart cities.
- Smart parking facilities and traffic management system have always been at the core of constructing smart cities.
- In this project ,we address the issue of parking and present IOT based cloud integrated smart parking system.