

Automatic Smart Parking System using Internet of Things (IOT) for Parking Provider

Soundarya .A¹, Yashaswini .N², Megha .M .S³, Sandhya .P .M⁴, Dhanalaxmi .H .R⁵

^{1, 2, 3, 4}Department of EEE, GSSSIETW, Mysuru , Karanataka, India

⁵ Assistant Professor, Department of EEE, GSSSIETW, Mysuru, Karanataka, India

ABSTRACT

Internet of Things (IOT) plays a vital role in connecting the surrounding environmental things to the network and made easy to access those un-internet things from any remote location. It's inevitable for the people to update with the growing technology. And generally people are facing problems on parking vehicles in parking slots in a city. In this study we design a Smart Parking System (SPS) which enables the user to find the nearest parking area and gives availability of parking slots in that respective parking area. And it mainly focus on reducing the time in finding the parking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area. Thus it reduces the fuel consumption which in turn reduces carbon footprints in an atmosphere.

Keywords: IOT, sensors, web page, Wi-Fi module

I. INTRODUCTION

The project aims at designing an advanced smart parking system using IOT technology. The devices can be switched ON/OFF using a mobile through server (Wi-Fi). Automation is the most frequently spelled term in the field of electronics. The hunger for automation brought many revolutions in the existing technologies. These had greater importance than any other technologies due to its user-friendly nature. These can be used as a replacement of the existing switches in home which produces sparks and also results in fire accidents in few situations. Considering the advantages of Wi-Fi an advanced automation system was developed to monitor the status of parking slots.

Wi-Fi (Short for **W**ireless **F**idelity) is a wireless technology that uses radio frequency to transmit data through the air. Wi-Fi has initial speeds of 1mbps to

2mbps. Wi-Fi transmits data in the frequency band of 2.4 GHz. It implements the concept of frequency division multiplexing technology. Range of Wi-Fi technology is 40-300 feet. The controlling device for the monitoring in the project is a Microcontroller. The data collected by the Microcontroller. Microcontroller reads the data and sends the data over Wi-Fi to the IOT web page. The Microcontroller is programmed used embedded „C“ language.

II. METHODS AND MATERIAL

We conducted an experiment in order to depict the working of our system at every stage from checking the availability of parking space to actually park a car in a vacant parking slot.

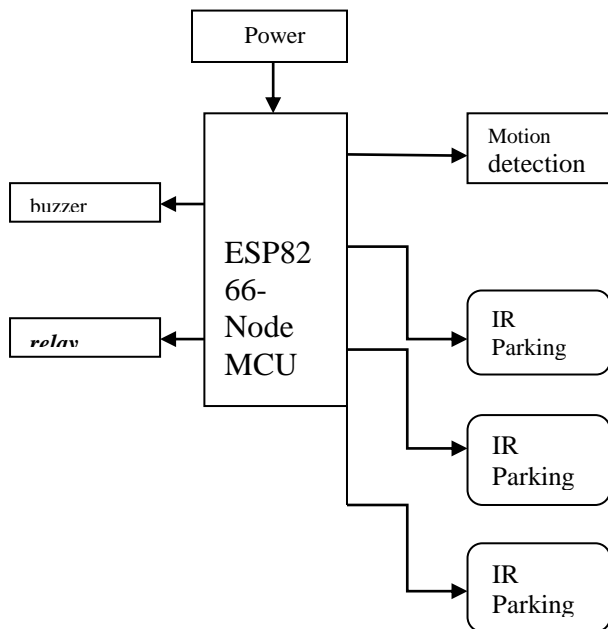


Figure 1. block diagram of smart parking

Circuit diagram

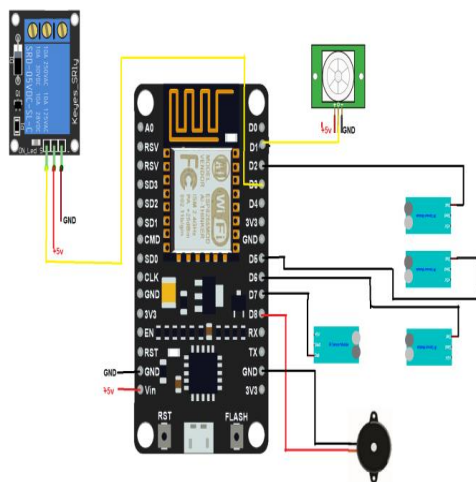


Figure 2. circuit diagram of smart parking

Esp8266-Node MCU:

NodeMCU is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The term "NodeMCU" by default refers to the firmware rather than the dev kits. The firmware uses the Lua scripting language. It is based on the eLua project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects.

Is a controller along with a wifi chip on board ,where over this project we are using this module to connect as to make project low cost ,more compact and flexible of using .Esp8266-node mcu will be connected with internet ,by connecting it wireless broadband which are providing internet like modems installed with wifi along with internet , connecting esp8266 node mcu with particular server page as to monitor the status of parking of number of cars over the parking area owner and this helps allotting location to new vehicles entering the parking area.

Motion detection sensor:

PIR sensor:

used to know the status parking area during night times any people on parking area try to make vehicle theft its all done with help of the motion detection sensors.

LDR:

To now the parking status is it much sunny day need to be cars covered by high humidity and temperatures.

IR:

This sensor is a short range obstacle detector with no dead zone. It has a reasonably narrow detection area which can be increased using the dual version. Range can also be increased by increasing the power to the IR LEDs or adding more IR LEDs.

Using iR the parking of vehicles will be detected ,where using node mcu we are implementing 6 parking space with containing individual ir sensor to know the status of parking space, based on this the parking space will allotted.

III. RESULTS AND DISCUSSION

The project "IOT based Smart Parking system" was designed such that the status of parking slots can be known from anywhere in the users webpage. This is achieved using Wi-Fi communication.

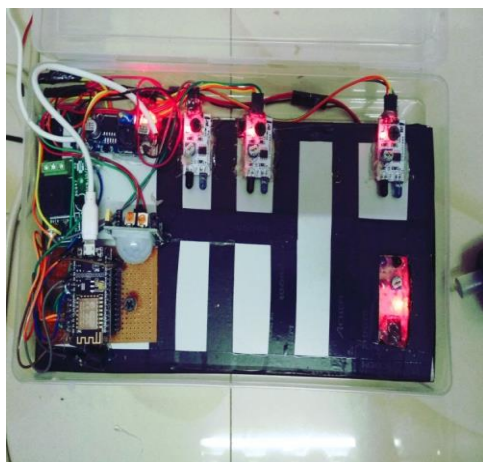


Figure 3. working model of project

In this system, the user has to be connected to the Wi-Fi network of that particular parking area through which he is given access to the webpage and can know about the status of the parking slot.

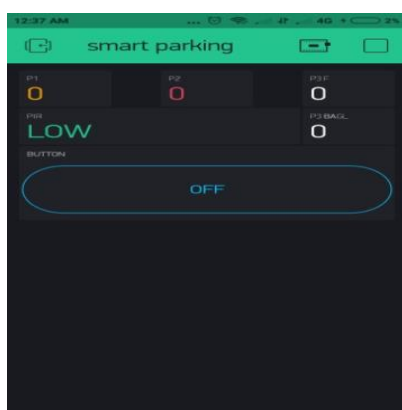


Figure 4. display of availability of slots

IV. CONCLUSION

The concept of Smart Cities have always been a dream for humanity. Since the past couple of years large advancements have been made in making smart cities a reality. The growth of Internet of Things and Cloud technologies have give rise to new possibilities in terms of smart cities. Smart parking facilities and traffic management systems have always been at the core of constructing smart cities. In this paper, we address the issue of parking and present an IoT based Cloud integrated smart parking system. The system that we propose provides real time information regarding availability of parking slots in a parking

area. Users from remote locations could book a parking slot for them by the use of our mobile application. The efforts made in this paper are indented to improve the parking facilities of a city and thereby aiming to enhance the quality of life of its people.

V. REFERENCES

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