



IOT Based Smart Parking System using NODEMCU

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Abstract :-

The day to day industrialization of the developing countries has led to the increase in the need for vehicles. This results in the emerging of new vehicles into the market. There is increase in the number of vehicles but not increase in the parking space. Most time is wasted in search of the vacant parking place. This is the main reason for the parking problem in busy areas. In order to solve the problem, the need of automatically parking system, online (using internet) parking slot booking, multi-story parking garage etc., are increased.

The main aim of this project is to create an online parking slot booking and also provide protection with various security algorithms from intruders. In the today life work a prototype of online smart parking system is developed and a mobile Application is developed which will allow the user to find the vacant parking slots using their phones.

In this modern world, where world's population is crossing around 17 billion and still increasing people's needs are constantly increasing at every minute. Shopping malls, Movie theatres are acquiring large ground and people are going to face problems about parking their vehicles resulting in long traffic jams on main roads and frustration faced by the car drivers.

Therefore, to overcome these problems smart parking systems are coming in now-days. Using IOT, solutions are made to overcome the problems. This paper will provide the brief idea about how smart parking systems are important and various inventions made in this area.

Keywords:- Industrialization ,Parking system, Mobile application, IOT.

I. INTRODUCTION

The aim of the project is to design, develop and build an IoT based Smart Parking System using NodeMCU ESP8266 with growing quality of good Cities. There's forever a requirement for good solutions for each domain. The IoT has

enabled the likelihood of good Cities with it's over the net management feature. Someone will manage the devices put in his home or workplace from any place within the world by simply checking a Smartphone or any net connected devices. There are unit multiple domains during a good town and good Parking is one amongst the favoured domains within the good town.

II. LITERATURE SURVEY

One of the primary experimental paradigm of an automatic parking system was developed on an electrical automobile Ligier at INRIA (i.e. French Institute for analysis in engineering associateAutomation) within the mid-1990s.

1990 - The automated parallel parking formula localizes a sufficient parking place on the wayside, attains a convenient begin location for the automobile ahead of the parking place, and performs a parallel parking manoeuvre. Automatic family planning involves localizing associate obtainable house for the automobile motion inside the parking place, putting the automobile at associate applicable spot at the rear of the parking place, and playing a Manoeuvre to tug out of the parking place into the lane.

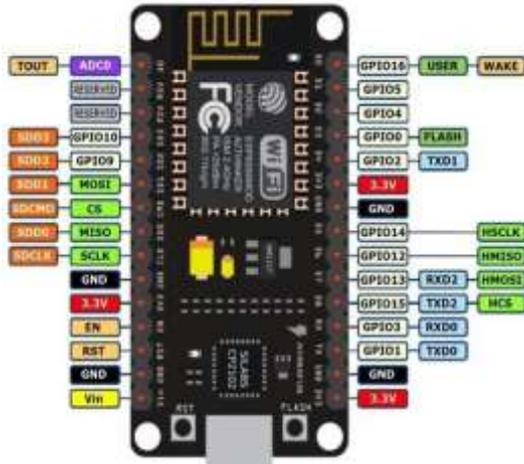
1992 - Volkswagen planned associate automatic parking technology mistreatment machine steering in its IRVW (Integrated analysis Volkswagen) Future construct automobile, permitting it to maneuver sideways for parallel parking. However, no industrial version of this technology was ever offered.

2015 - Bosch plans to unharness a completely machine-controlled parking system. This driverless system permits the driving force to induce out of the automobile associated activate an autonomous parking from a smartphone. The system can calculate a parking manoeuvre and monitor the environment.

2017 - a bunch in Tunghai university, Taiwan, develops sensible parking system. System navigates driver to the parking through voice navigation.

A) NODEMCU (ESP8266)

The NodeMCU is an open-source firmware and development kit that helps you to Prototype your product within a few Lua script lines. ESP8266 has powerful on-board processing and storage capabilities that allow it to be integrated with the sensors specific devices through its GPIOs with minimal development up-front and minimal loading during runtime.



C) SERVO MOTOR

Servo Motor is a rotator device that allows the control of linear as well as angular motion. A Servo Motor is used for the opening and closing of the gate. Servo drive sends electrical signals to the Servo Motor for producing motion.



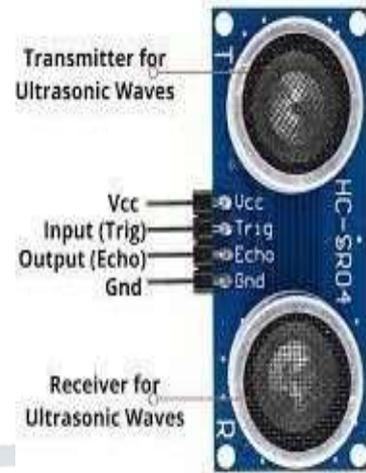
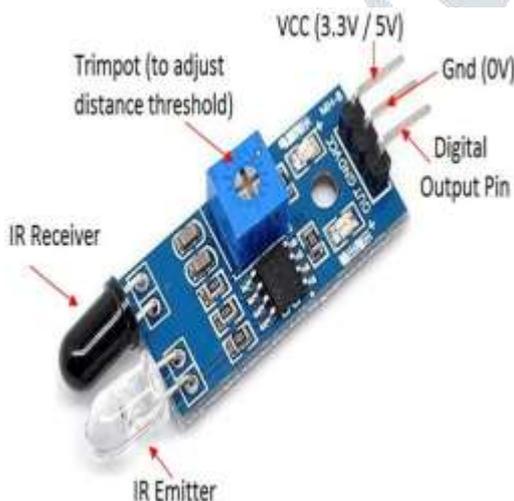
IV. WORKING

Smart Parking System consists of Two Servo Motors, One Ultrasonic Sensor, Two IR Sensor and One 16x2 LCD. Here, ESP8266 will control the entire process and send the parking status information to Google Firebase through Internet so that it can be checked from anywhere in the world through internet. TwoIR sensors are used at the entry and the exit gate to check the presence of vehicle and process automatically close or open the gate. IR Sensors are used to detect presence of any object by transmitting and receiving the IR rays.

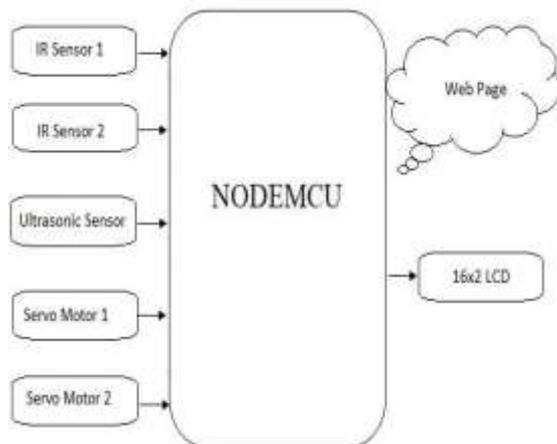
Two servo motors will act as the entry and the exit barrier and they rotate to open or close the gate. Finally an Ultrasonic sensor is used to detect, if the parking slot is occupied or available and send the information to ESP8266 .

B) IR SENSOR

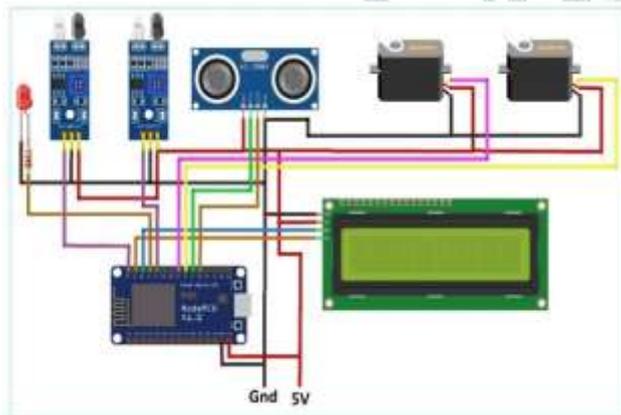
An IR sensor is basically an electronic device which is used to detect the presence of objects. Infrared light is emitted by this device. If this device does not detect any IR light reflected back this means that, there is no object present. If the light is detected by the sensor then there is an object present.



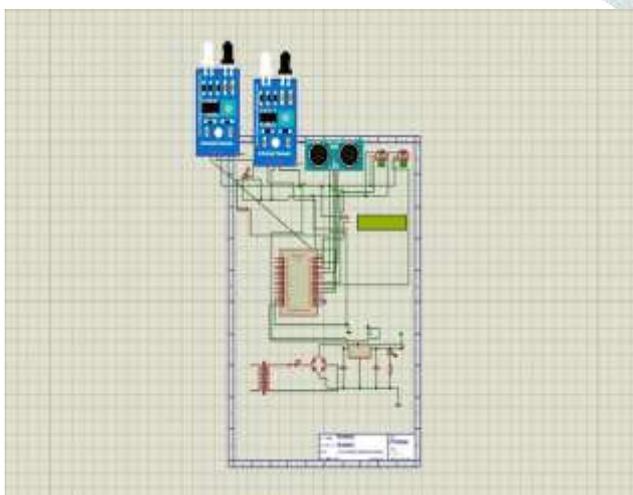
V. BLOCK DIAGRAM



VI. CIRCUIT DIAGRAM



VII. CIRCUIT DIAGRAM (SIMULATION)



- Smart Parking System reduces the time to locate a vehicle in parking areas and hence it reduces fuel consumption.
- It also eliminates the unnecessary travelling of vehicles across the filled parking slots in a city.
- Developing Smart Parking Systems within a city solves the pollution problem.
- Fuel saving (According to a recent report, Smart Parking can result in 2,20,000 gallons of fuel saving till 2030 and approximately 3,00,000 gallons of fuel saved by 2050).

IX. FUTURE SCOPE

- The Future Scope is to adopt this Smart Parking System (SPS) so that availability of parking slots could be viewed on a mobile phone Application or even to satellite navigation device so that drivers will always be aware of whether there are available parking slots or not.
- And enhance to send notifications to the user's mobile phone when vehicle enters to a particular shopping malls and some streets in a city etc.

X. CONCLUSION

The idea of sensible cities have continually been a dream. There are advancements made of the past number of years to form sensible town dream to reality. The advancement of web of things and cloud technologies has given rise to the new potentialities in terms of sensible cities. Sensible parking facilities have continually been the core of constructing sensible cities. The system provides a true time method and knowledge of the parking slots. This paper enhances the performance of saving users time to find associate degree acceptable parking zone. It helps to resolve the growing downside of holdup. As for the long run work the users will book a parking zone from a far off location. GPS, reservation facilities and registration code scanner will be enclosed within the future.

XI. REFERENCES

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