

Survey Paper on An IoT Based Smart Parking System

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ABSTRACT

Internet of Things (IoT) plays a important role in connecting the over all environmental things to the network and it is easy to access those un-internet things from any remote location. It's unavoidable for the people to update with the increase technology. [1] And generally people are facing problems on parking vehicles in parking slots in a parking area. In this study we plan 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. It mainly concentrates on reducing the time in finding the parking area and also it avoids the unnecessary travelling through filled parking areas in a parking area. Thus it decreases the fuel consumption which in turn reduces carbon footprints in an atmosphere.

Keywords: Smart Parking, IoT, NodeMCU, Ultrasonic Sensor, Arduino IDE, Smart City

I. INTRODUCTION

As increasing this latest trending technology Internet of Things, it promises to connect all our surrounding things to a network and communicating with each other with less human involvement. Still internet of things is in starting stage and there is no common design exists till today [1] There is lot of researches and implementations are currently being going on in all the respective areas. Thus there is no direction or limitation exists to define the definition of internet of things. So depending on the factors, application the internet of things has different definitions. It is stated as the things present in the world or in an environment are attached with sensors or with any embedded systems and connected to network with the help of wired or wireless connections.

Project Objective:

- a) a) To develop an intelligent, user friendly automated car parking system which decreases the manpower and traffic overcrowding.
- b) To safe and secure parking slots within restricted or finite area.

Types of Sensor in Smart Parking System:

Ultrasonic ranging module HC - SR04

Features: -

Provides 2cm - 400cm non-contact measurement function, the ranging exactness can reach to 3mm. It include ultrasonic transmitters, receiver and control circuit. The basic principle of work:

- (1) Using Input Output trigger for at least 10us high level signal,
- (2) The Module automatically sends eight 40 kHz and identify whether there is a pulse signal came back.

(3) IF the signal came back, through high level, time of high output I/O duration is the time from sending ultrasonic to returning.

Test distance = (high level time*velocity of sound (340M/S) / 2.

NodeMCU 1.0 ESP8266 12E

MCU ESP8266EX is embedded with Tensilica L106 32-bit micro controller (MCU), which characteristics extra low power consumption and 16-bit RSIC. The CPU clock speed is 80MHz. It can also extend a maximum value of 160MHz. Real Time Operation System (RTOS) is enabled. Currently, only 20% of MIPS has been absorb by the Wi-Fi stack, the rest can all be used for user application programming and development.

II. LITERATURE SURVEY

Car parking system is a system that is used to help arrange cars in parking area in other to avoid overcrowding and arrange cars in an allocated position. They system alsobhelps to track how many cars pass throught the gates and the durayiom taken by each,and then it will calculate the amount of money a car should pay when existing. Car parking system is being used in many congested area or location where there are more than one shopping complex near to each other or where there is megamall or stadium,colleges,offices.

Many cities viewed that the drivers had real time problems to find a parking space easily especially during peak hours, festivals season, etc. Even if the parking space is well known, many vehicles may lead to small number of parking space which in turn leads to traffic congestion.

Many approaches had been made to control the difficulties of parking area and as a result many system and technologies are developed for parking. The parking area is divided into different slots. Each slot is allotted by one IR or ultrasonic sensor. IF the

slot is empty the slot will show the green color and the slot is booked it will be shown by the red color

In this paper ,they introduce a smart parking reservation and sefurity maintenance in a commercial car parking area in enviornment. Here they give major response to users reservation action and hence the driver can reserve this own likely parking slot based on the cost function. Instead of efficient car parking we need to a special security system[9].

In this paper the system assign and reserves an optima;l parking space based on the drivers cost function that both proximity to destination and cost of parking slot[7].

In this paper we study the parking slot monitoring tools parking slots reservation module, and security for the vehicle .This system holds best for parking system it provide high security fot the parking system . This system reduce the traffic and congestion in finding the available parking spots.[10]

III. FUTURE WORK

This system can be implemented using LoRa network. It will provide us the free local network to connect all the sensors in the city and upload the data on the internet using the common LoRa gateway installed. The sensors will collect the parking data of the users and the analysis can be done on that data. The analyzed result can be used for further improvements and research on the user behaviors.

IV. CONCLUSION

This designed automatic smart parking system which is simple, economic and provides effective solution to reduce carbon in the atmosphere. It is well managed to access and map the status of parking slots from any remote location through web browser. Thus it reduces the risk of finding the parking slots in any

parking area and also it eliminates unnecessary travelling of vehicles across the filled parking slots in a city. So it reduces time and it is less cost also.

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