



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 4, Issue 2)

Available online at: www.ijariit.com

Automatic Smart Parking System using Mobile Application

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ABSTRACT

Internet of Things (IOT) plays a vital role in connecting the surrounding environmental things to the network and made easy to access those uninternet 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 designed 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 with the help of android app and it mainly focuses on reducing the time in finding the parking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area by making use of sensor which continuously detects the parking slots and with the help of android app user comes to know the status of the parking area. Thus it reduces the fuel consumption which is eco-friendly and in turn reduces carbon footprints in an atmosphere.

Keywords: IOT, Sensors, GSM, Android Studio.

1. INTRODUCTION

The undertaking goes for planning brilliant parking framework utilizing IOT innovation. Automation is the most every now and again spelled term in the field of hardware. These had more prominent significance than some other advances because of its easy to use nature. Considering the advantages of GSM a propelled mechanization framework was created to screen the status of parking spaces. The controlling gadget for the checking in the understanding is a microcontroller. The information gathered by the microcontroller. Microcontroller peruses the information, sends the information to GSM module to Android App. Embedded C language is used for programming the microcontroller.

2. LITERATURE SURVEY

In 2013 paper recommends a novel "Smart parking" framework for an urban nature's domain. This system assigns and reserves the parking place based on the driver's cost function, which combines the proximity to destination and cost for the vehicle parking. This methodology solves a mixed-integer linear programming problem. Here a new light system scheme is proposed to assurance client reservation. The main advantage of this paper is the availability of reservation and efficient resource allocation but the difficulty in reservation and slot confirmation is required for the user.

In 2014 paper mean to exhibit a clever system for parking slot detection based on Image processing strategy. The proposed framework catches and from the adjusted picture drawn at parking slot and creates the data of the empty parking slots. The camera is used as a sensor to take photographs to demonstrate the inhabitanancies of parking slots. The proposed framework is produced in both hardware and software stage. The main advantage of this system is Images are captured and vacancies are identified for the users and the single camera is used as a sensor but whether condition affects the system and the camera should not be obstructed and also no guidance here. These are some problems appear here.

In 2014 there were six types of calculations to assistance. (1)The plate localization algorithm is dependent on joining together morphologic operation delicate to particular shapes admitted to picture with a great edge. (2) Plate Sizing and Orientation components of algorithms that acclimatize for the angular skew of the authorization angel to accurately and proportionally compute to a maximum range. (3)Optimal Character Recognition it interprets the caught picture under an alpha numeric content passage. (4)Syntactical/Geometrical Analysis supports and verifies alpha numeric advice and arrangement with a specific aphorism set. (5)Normalization supports over managing the difference and brilliance if those caught permit plate picture. (6) In Character Segmentation, there are two sorts of permit plate over India. A person may be bootleg characters for the yellow foundation. And the other is bootleg character done with white foundation. The colored picture may be converted under gray scale picture. Thus these algorithms consume more time and number plate recognition is difficult and reservation is not possible

In 2014 the framework utilizes remote sensors keeping in mind the end goal to screen the cars in the stopping zone. Each car comprises of a dynamic RFID label installed in it keeping in mind the end goal to extraordinarily character. The system uses RFID tags for gate management which is low cost, the gate automatically opens using the RFID reader. The main drawback was no driver guidance was given.

In 2015 the system uses Bluetooth to find the empty space in the parking area and give the information about empty parking space within the range of Bluetooth. The mobile's Bluetooth used for identification, registration and the rack and pinion mechanism for linear motion. The unique registration number is detected with the help of Bluetooth chip. The disadvantage is with designing the whole system with rack and pinion mechanism.

3. SYSTEM D

3.1 System Working

Microcontroller (PIC16F877) is a little PC on a solitary coordinated circuit. A microcontroller contains at least one CPUs (processor centers) alongside memory and programmable info/yield peripherals. Microcontroller makes it practical to carefully control much more gadgets and procedures. This is capable of 200 nanosecond guideline execution yet simple to program CMOS FLASH-based 8 bits, self-programming, 2 comparators, and eight channels of 10-bit analog -to- digital (A/D) converter.

The main blocks of the model are:

- Microcontroller (16F77)
- IR Sensors
- Regulated power supply
- GSM Module
- LED indicator
- Crystal oscillator

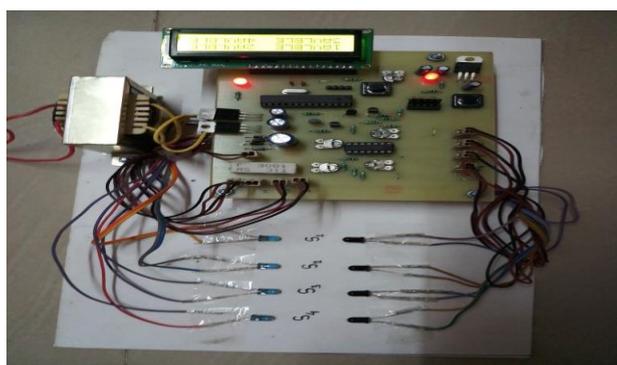


Fig 1. Model of Smart Parking System

An Infrared sensor is an electronic instrument which is utilized to detect certain qualities of its surroundings by either emanating or additionally identifying infrared radiation. Infrared sensors are likewise fit for estimating the warmth being discharged by a protest and identifying movement. The IR sensor range will be 5cm. it senses the slots in the parking area.

An energy supply will be an electrical gadget that supplies electric force of an electrical load. Those elementary works of an energy supply may change over electric current from a hotspot of the right voltage, current, and recurrence to control those loads. Load appliances that the energy illustrations of the last incorporate control supplies found in desktop computers and customer hardware unit.

A crystal oscillator is an electronic oscillator circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a precise frequency. This frequency is often used to keep track of time, as in quartz wristwatches, to provide a stable clock signal for digital integrated circuits, and to stabilize frequencies for radio transmitters and

receivers. A clear oscillator decided one fabricated of quartz crystal, works in actuality distorted by an electric field back voltage is activated to an electrode near or on the crystal.

3.2 Software Requirements

i. JDK

Since the introduction of the Java platform is done by the Software development kit (SDK).The JDK version is `jdk1.6.0_07`.

ii. JRE

The Java Runtime Environment (JRE) may be situated about programming instruments for the development of Java applications. It combines the virtual machine (JVM), platform core classes and supporting libraries.JRE is a part of JDK but it is downloaded independently.JRE was initially created by Sun Microsystems Inc., a wholly-owned subsidiary of Oracle Corporation. The JRE version is `jre1.6.0_07`.

iii. ANDROID STUDIO

Android studio may be the official incorporated advancement or Integrated Development Environment (IDE) to Google's Android operating system, assembled on Jet Brains, IntelliJ thought product also outlined particularly to Android Application Improvement. It may be accessible for download on Windows, macros furthermore Linux operating systems.

4. WORKING

In our project “Automated smart parking system using IOT” is primarily accepted to screen the status of the gadgets through GSM. The controlling gadget of the entire framework is a microcontroller. The interfacing devices are GSM module and IR Sensors.IR sensors are encouraged as a contribution to the microcontroller. The microcontroller forms this information and transmits over GSM, which will be gotten from portable. A program written in embedded C language is stacked into the microcontroller. The client who needs to stop the vehicle is associated with the GSM system of that specific parking area. The IR Sensors send the status to the microcontroller where the information preparing is finished. The microcontroller sends the information to the cloud database frequently about the status of the parking slot using IOT. Hence in this way, the user who is having the smart parking system android app on his android phone can very easily find out the available parking slot without any traffic congestion and also in very less time

5. CONCLUSION

The security characteristic of the framework is improved with secrete key upon entrance to the parking area. This task could be chance for a developed application of booking the parking slot before arriving at the end. This could make attained utilizing GSM.

6. RESULTS

The one task “IOT based smart parking system,” has been planned such that the status of parking slots could make referred to starting with anyplace in the clients android app. This may be achieved by utilizing GSM.



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