

Reservation Based Smart Parking Using Internet of Things for Smart Cities

G.Kiranmayee¹, K. Manjunath²

¹M.Tech Student, Department of ECE, Sree Rama Engineering & Technology, Tirupathi, Andhra Pradesh, India

²Assistant Professor Department of ECE, Sree Rama Engineering & Technology, Tirupathi, Andhra Pradesh, India

ABSTRACT

Finding a parking spot in focal city territories, particularly amid the peak hours, is difficult for drivers. The issue emerges from not having the information of where the accessible spaces might be at the time, regardless of whether known, numerous vehicles may look for exceptionally constrained parking spots to cause serious movement blockage. In this paper we are presented and execution with a model of Smart Parking System that licenses drivers to viably find and withhold the empty parking spots in said. The framework executed is fetched proficient savvy stopping framework for multi-level stopping office IR Sensor and build up an android based application. The framework screens the accessibility of parking spaces and aides the vehicle to the closest free opening. Cost is limited by keeping the quantity of sensors low without yielding the unwavering quality. Vitality utilization of every bit is held under wraps by enabling the frameworks to rest intermittently and by decreasing their correspondence extend.

Keywords : IoT, Arduino, GPRS, LCD,RFID

I. INTRODUCTION

In the few a years ago, numerous examinations have been improved the situation shrewd city applications. The growth of the Internet of Things and Cloud technology concepts allows rising of many possibilities for smart cities. Parking problem that aims to find, reserve, and provide the best location for each driver is an important problem in the city, because of energy consumption and time spending during searching for car parking in the limited parking area.

A.Literature survey:

In this paper, we mainly focus on designing a new smartparking system that assists drivers to find parking spaces in a specific parking district. In addition, an important goal of the system is to reduce

the traffic searching for parking, hence reduce energy consumption and air pollution. look for vacant spaces in the neighboring parking lots.

B.Existing System:

The parking system is monitored by human source which causes many problems when the area is very large. Since a human cannot monitor continuously If parking system is very small it also cause problem when a vehicle enters or returns. So we have to adopt new technology to solve this type of problems.

Drawbacks:

- Traffic conjunction
- Long waiting time

Proposed system:

The smart parking can be considered as an application of IOT. The concept of smart city aims to

meet the needs of the people, to provide more efficient use of general resources and to reduce the working costs.

BLOCK DIAGRAM:

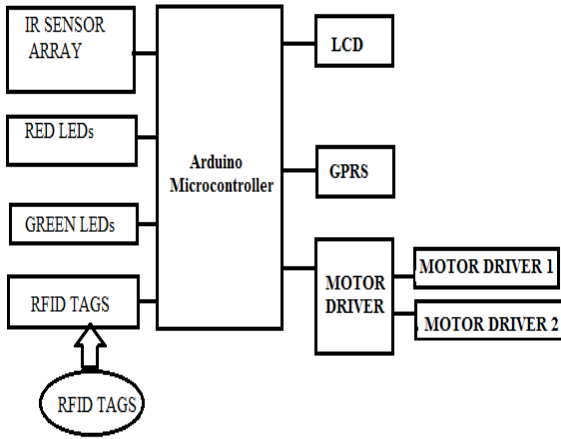


Figure 1. Block diagram

Hardware Requirements:

A.ARDUINO UNO

Arduino UNO is ATMEGA38 controller has 14 for digital connectivity, 6 analog pins for analog interface, a 16 mega hedge crystal oscillator frequency, USBconnectivity, a power connector, an ICSP header, and a reset get.



Figure 2

Arduino Board:

The Arduino board has input/output pins. It has pins from 0 to 13 that can be used as digital input from Switches A0-A6 as analog pins. In this PWM pins are there 3, 5, 6, 9, 10, &11.

B.Features of Arduino (atmega38p):

- Most executable guideline is single clock cycle
- At 20 Mega hedges it has this throughput up to 20 Million Instructions/Second
- It will get reset when power on.
- It internal Oscillator
- For serial communication here in this Arduino Board has pins 0, 1 are serial communication port pins

C. POWER SUPPLY:

Power is used to convert AC(alternating current) to DC(Direct Current).in detail explanation of each and every component is below.

1.Transformers

A transformer is an electromagnetic device that exchanges electrical vitality between at least two circuits through electromagnetic energy.

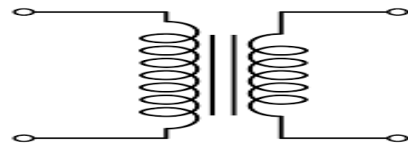


Figure 3. transformer symbol.



Figure 4

2.Rectifier:

Rectifier is convert AC voltage to pulsating DC voltage. There are two types of rectifiers.1.half wave rectifier and full wave rectifier.



Figure 5

3.Capacitors:

Capacitor is an electronic component that stores an electric charge and releases. Capacitors are used as filters.

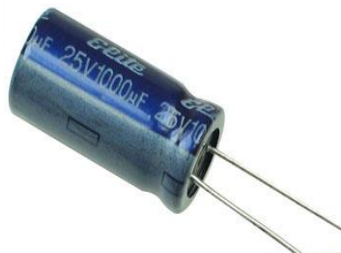


Figure 6

4.Voltage regulators:

A voltage regulator is an electrical regulator designed to automatically maintain a constant voltage level. The 78xx (also sometimes known as LM78xx). XX series indicates voltage like 5v and 12v.

7805 Pinout

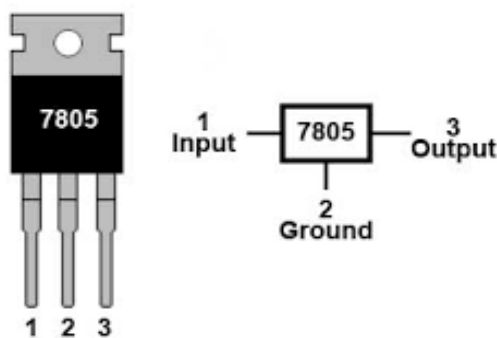


Figure 7

D.IR SENSORS:

The IR Sensor-Single is a universally useful vicinity sensor. Here we utilize it for individual identification.. The module comprises of an IR producer and IR collector match. The high accuracy IR beneficiary dependably distinguishes an IR flag. The module comprises of LM 358 comparator IC.The yield of sensor is high at whatever point it matches

IR recurrence and low generally. The on-board LED marker encourages client to check status of the sensor without utilizing any extra equipment. The power utilization of this module is low. It gives a computerized yield.

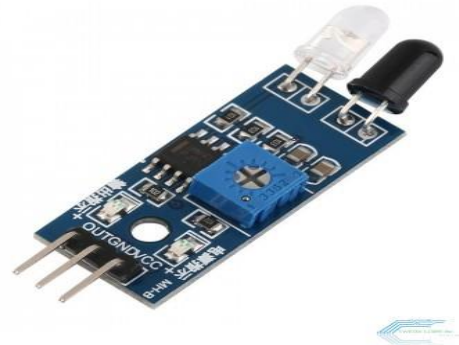


Figure 8. IR sensor

E.Motor:

In a part of the contraptions wanders you may need to control a DC Motor with Arduino microcontroller. The most extraordinary current that can be sourced or sunk from a 8051 microcontroller is 15 mA at 5v.However, a DC Motor needs streams particularly more than that and it require voltages 6v, 12v, 24v etc eater, dependent upon the sort of motor used. Another issue is that the back emf conveyed by the motor may impact the most ideal working of the microcontroller.On account of these reasons we can't interface a DC Motor particularly to a microcontroller.



Figure 9

DC motor

To conquer this issue the L293D driver IC is utilized. It is a Quadruple Half H-Bridge driver and it takes care of the issue totally. You needn't interface any transistors, resistors or diodes. We can without much

of a stretch control the exchanging of L293D utilizing a microcontroller or specifically to a microcontroller.

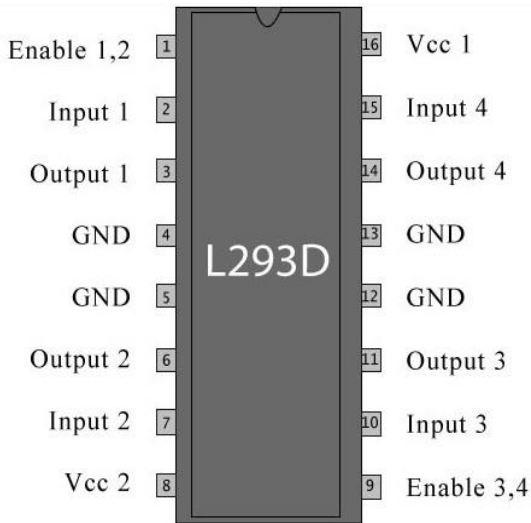


Figure 10. Motor driver

F.LCD (Liquid Crystal Display)

LCD screen is a computerized show module and find a tremendous mishmash of occupations. A 16x2 LCD demonstrates is fabulously fundamental module and is usually utilized as a bit of various devices and circuits. These modules are reinforced in excess of seven parts and assorted multi segment LEDs.

The cost enlist shops the summon course given to the LCD. A summon is a direction given to LCD to complete a predefined undertaking like introducing it, clearing its show, putting the cursor work, controlling display and so on. The estimations select shops the experiences to be showed up on the LCD. The realities are the ASCII estimation of the character to be exhibited at the LCD. Snap to soak up extra about internal structure of a LCD. There are different styles of LCD takes after 16x2 and 20x4. Here on this test we use 16x2 LCD. Here we use spot grid LCD.

Pin Diagram:

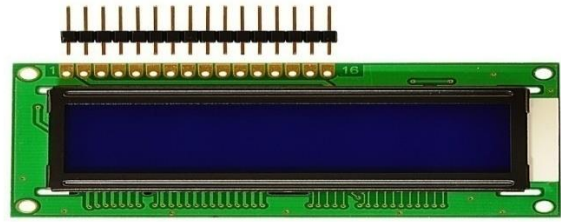


Figure 11

G.GPRS:

It is a standard set made by the ETSI to depict traditions for second time (2G) mechanized cell frameworks used by mobile phones. A GPRS module has a MAX-232 interface for serial reaction with an outside World. For this condition, the transmitter (Tx) of the PC's Serial port is associated with the Receiver (Rx) of the GPRS module's MAX-232 interface. The transmitter (Tx) of the MAX-232 of GPRS module is connected with Receiver (Rx) of microcontroller's serial transmission stick.

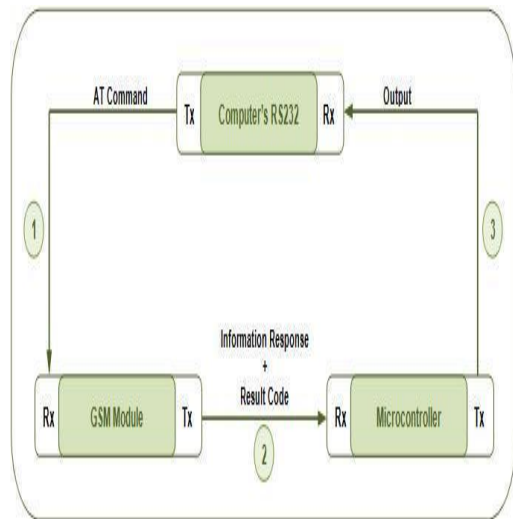


Figure 12

GPRS module is interfaced with Arduino Processor by adjusting the TX, RX and ground pins in it

H.RFID

RFID is a tracking technology used to identify and authenticate tags that are applied to any product, individual or animal. Radio frequency Identification and Detection is a general term used for technologies

that make use of radio waves in order to identify objects and people.



Figure 13

6. software requirements:

Arduino IDE:

The Arduino IDE writing Arduino micro controller programs is an open source programming, where we can have the case codes for the understudies. In the Present version in the Arduino IDE is in which present usage is 1.8.5. It is very easy to connect the PC with Arduino Board.

7. Working:

This project contains IR sensors as input devices. IR sensor detects the vehicle at parking place. If parking slot is empty it then open the gate else it won't open the gate. It continuously status updates in to cloud server through GPRS.

8. Results:

Following are the results when data upload to the server which contains the information about the slot are either filled or not.

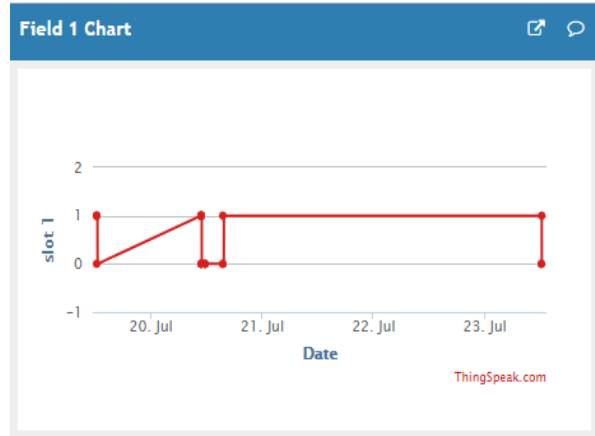


Figure 14

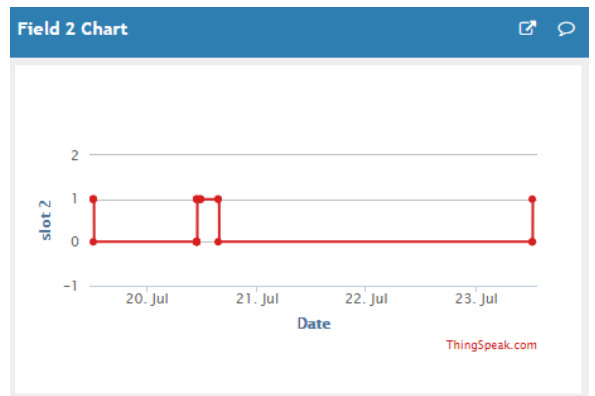


Figure 15

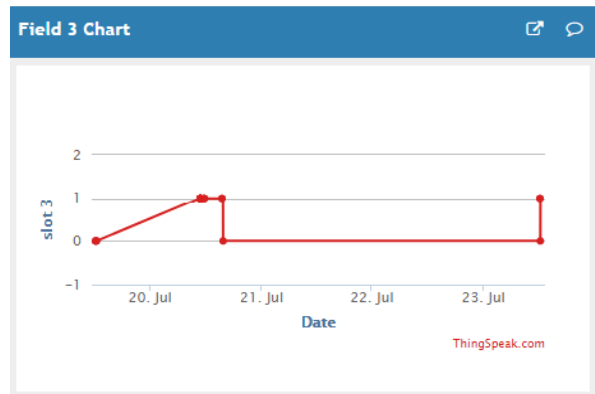


Figure 16

created_at	entry_id	field1	field2	field3
2018-07-19 06:55:10	1	1	1	0
2018-07-19 06:56:12	2	1	1	0
2018-07-19 06:57:16	3	1	1	0
2018-07-19 06:58:57	4	0	0	0
2018-07-20 05:19:36	5	1	0	1
2018-07-20 05:20:33	6	1	0	1
2018-07-20 05:22:25	7	1	0	1
2018-07-20 05:25:14	8	1	0	1
2018-07-20 05:26:12	9	1	0	1

1 indicates slots are filled

0 indicates slots are empty

By using the things speak server we also get the information to the smart phone

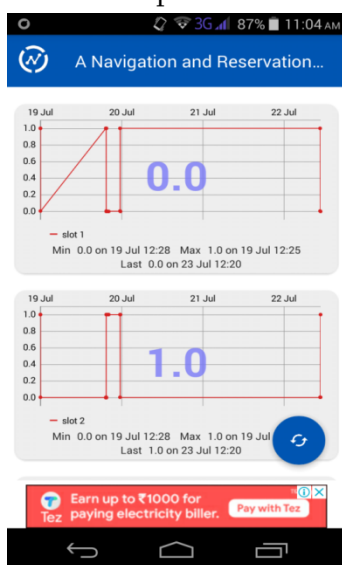


Figure 17

Applications:

- Facility Management
- Health Care
- Environment Monitoring
- Intelligent Buildings
- Disaster Relief

Advantages:

- Flexibility
- Inherent Intelligence
- Low Cost
- Rapid Deployment
- More Sensing Point

II. CONCLUSION

This project programmed savvy stopping framework which is basic, monetary and gives compelling answer for lessen carbon impressions in the climate. It is all around figured out how to access and guide the status of stopping openings from any remote area through internet browser. Accordingly it lessens the danger of finding the stopping spaces in any stopping zone and furthermore it takes out pointless bridging the Filled stopping openings in a city. So it diminishes time and it is savvy moreover.

III. REFERENCES

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