

Parking Lot space detection using IoT

[1]Madhavan P ,[2]Dinesh M ,[2]Gogularamana M,[2] Arnesh R,

[1] Assistant Professor ,[2]UG Student

Department of Electronics and Communication Engineering
Muthayammal Engineering College ,Namakkal ,Tamil Nadu, India

Abstract- Internet of Things (IOT) plays a vital role in connectin Internet g 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 parking lot space detection 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, PARKING LOT

I. INTRODUCTION

Internet of things was first introduced in 1999 at autoIDcentre and first used by Kevin ashton. As evolving this latest burning technology, 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 beginning stage and there is no common architecture exists till today . There is lot of researches and implementations are currently being going on in all the respective areas. Thus there is no guidelines or boundaries exists to define the definition of internet of things. So depending on the context, application the internet of things has different definitions. Shortly it is defined as the things present in the physical world or in an environment are attached with sensors or with any embedded systems and made connected to network via wired or wireless connections . These connected devises are called as smart devices or smart objects. And it consists of smart machines which communicating interacting with other machines, environment, objects etc. And also it incorporates to connect any two machines, machine to human and viceversa etc. this communication is called as M-M communication. As M-M communication is developing by the various standardization bodies such as Open Mobile Alliance (OMA), European Telecommunication Standards Institute (ETSI), Institute of Electrical and Electronic Engineers (IEEE), 3rd Generation Partnership Project (3GPP) organization have performed some activities on M-M communication.

It makes daily life things to equip with transceivers, sensors, actuators and microcontrollers etc. for communication. Some important benefits of internet of things includes

- 1) Tracking behaviour;
- 2) Enhanced situational awareness;
- 3) Sensor driven decision analytics;
- 4) Instantaneous control and response. Etc.

IOT technology grows in various fields of smart applications but we have not yet found boundary constraints of this technology. Some smart applications which it has implementing currently such as on smart grids, smart lighting, smart energy, smart city, smart health etc. This is broadly classified into three categories such as sensing, processing and connectivity. Whereas sensing includes sensing the speed of vehicles and humans or any objects (accelerometer), sensing of temperature, pressure etc. And these can be processing by using some processors such as network processor, hybrid processor MCU/MPU etc. And the devices

are connected by using some technologies called GPS, Wi-Fi, BT/BTLE, RFID etc. More than half of the world's people are living in the cities. So the cities have reached full of its occupancy. As people uses vehicles for transportation so there is large number of vehicles exists for people convenience. Most of the time people spend their precise time on searching parking lots to park their vehicles. Thus congestion occurs in the traffic it leads to a hectic job to find the parking space to park their vehicle. The most traffic occurs only because of vehicle congestion in the urban areas thus people are wasting time in searching the parking area abnormally to park their vehicles. Our system is a Raspberry pi based parking sensor which contains pi-camera to detect the empty parking spaces and sends this data to server, this stored data is accessed by users .

II. EXISTING SYSTEM

Manual systems put pressure on people to be correct in all details of their work at all times, the problem being that people aren't perfect, however much each of us wishes we were. With manual systems the level of service is dependent on individuals and this puts a requirement on management to run training continuously for staff to keep them motivated and to ensure they are following the correct procedures. It can be all too easy to accidentally switch details and end up with inconsistency in data entry or in hand written orders. This has the effect of not only causing problems with customer service but also making information unable to be used for reporting or finding trends with data discovery. Reporting and checking that data is robust can be timely and expensive. This is often an area where significant money can be saved by automation.

III. PROPOSED SYSTEM

Parking lot space detection System reduces parking and retrieval time. Saves time spend in searching for empty parking slots and time spend is searching the parked car. Retrieval on average is 2 to 3 minutes. This Parking System is cost effective in terms of maintenance over the conventional parking systems. And also Parking System provides improved security, safety for the cars. Cars parked are free from theft and damages that can e caused while parking and retrieving. Drivers collect their cars from secure waiting areas; thus they do not have to walk through a car park alone and are less vulnerable System is environment friendly.

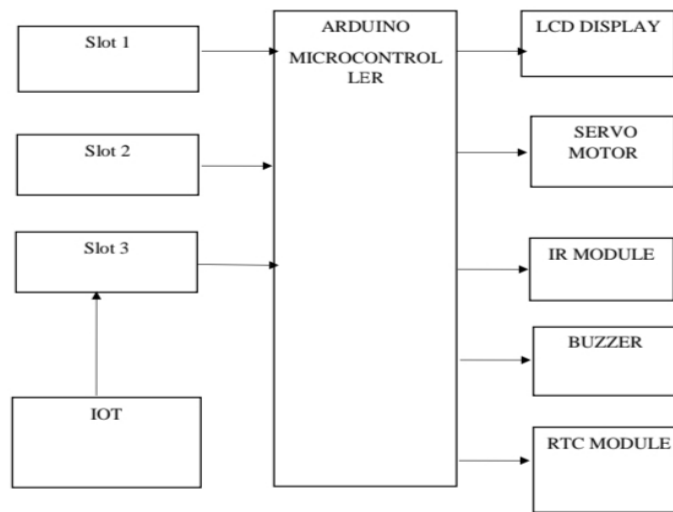


Figure :3.1 BLOCK DIAGRAM

IV. WORKING PRINCIPLE

The IR sensor detects the presence or absence of the car in the area and gives information to the Arduino controller, then from the controller the information is given to the

IOT, LCD and buzzer. The user uses the app for booking the area this can be done through the IOT. Then the particular time will be given to the user based on that amount the rate will be allotted. Once if the Customer parks the vehicle and if it still thereafter out of its time then the notification will be sent to the user in prior of 15 minutes and the buzzer will be given to the workers for alert.

V. RESULT AND DISCUSSION

The proposed system is successful in smartly addressing the challenges such as indicating status of parking slot well in advance to end-user, use of reserved and unreserved parking slots, wrong parking, unauthorized parking, real time analysis of free and

occupied slots, detecting multiple objects in a parking slot such as bike in car slot, fault detection in one or more components and traffic management during peak hours. The system minimizes the human intervention and saves time, money and energy.

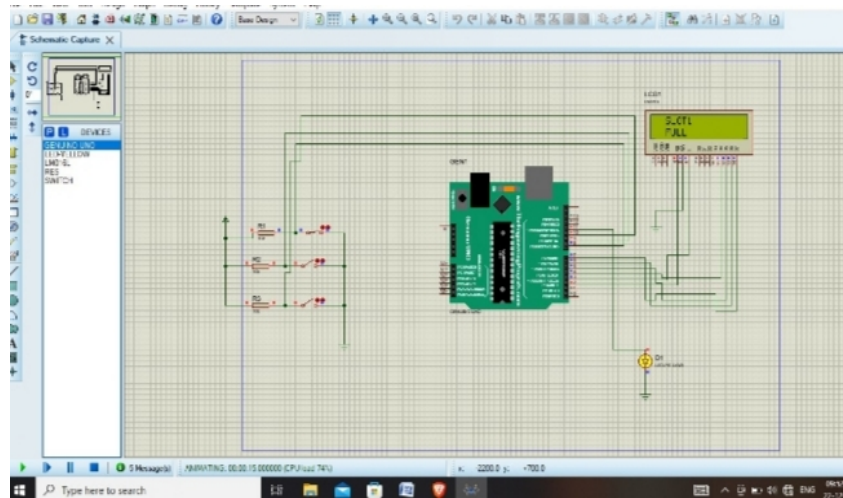


Figure :5.1 EXPERIMENTAL OUTCOME

VI.CONCLUSION

In this work, parking slot guidance system has been proposed which integrates several physical devices to check the parking slot availability. A mobile app was developed which allows the user to locate available parking lot. This proposed system reduces parking problem by collecting data regarding the occupancy state of parking lots and directs drivers to the closest vacant parking space thus reducing driver's effort and time in search for parking space. In our experiments, the proposed system had shown the accurate parking location service in parking lots and the proposed system supported the low implementation cost.

REFERENCES

- [1] Rico, J., Sancho, J., Cendon, B., & Camus, M. (2019 March). Parking easier by using context information of a smart city: Enabling fast search and management of parking resources. In *Advanced Information Networking and Applications Workshops (WAINA), 2019 27th International Conference on* (pp. 1380-1385). IEEE.
- [2] Zheng, Y., Rajasegarar, S., & Leckie, C. (2019, April). Parking availability prediction for sensor-enabled car parks in smart cities. In *Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), 2015 IEEE Tenth International Conference on* (pp. 1-6). IEEE.
- [3] Zhou, F., & Li, Q. (2019, November). Parking Guidance System Based on ZigBee and Geomagnetic Sensor Technology. In *Distributed Computing and Applications to Business, Engineering and Science (DCABES), 2014 13th International Symposium on* (pp. 268-271). IEEE.
- [4] Botta, A., de Donato, W., Persico, V., & Pescapé, A. (2018, August). On the Integration of Cloud Computing and Internet of Things. In *Future Internet of Things and Cloud (FiCloud), 2018 International Conference on* (pp. 23-30). IEEE.
- [5] Ji, Z., Ganchev, I., O'droma, M., & Zhang, X. (2019, August). A cloudbased intelligent car parking services for smart cities. In *General Assembly and Scientific Symposium (URSI GASS), 2019 XXXth URSI* (pp. 1-4). IEEE. International Parking Institute, "2019 Emerging Trends in Parking".
- [6] Ballon, P., Glidden, J., Kranas, P., Menychtas, A., Ruston, S., & Van Der Graaf, S. (2020, October). Is there a Need for a Cloud Platform for European Smart Cities?. In *eChallenges e-2020 Conference Proceedings, IIMC International Information Management Corporation*.