

Parking Control System using IR Sensor

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Abstract- This paper deals with sensing the vehicle in no parking area. It uses IR active sensor to sense the vehicle that stands in front of the sensor for a period of time. It immediately sends an alert message to the driver of the vehicle by means of glowing LED light. If the vehicle is not taken then the alert message is send to the traffic cop and action will be taken on that driver. The advantage of this device is to reduced the traffic in the peak areas, and to create awareness among the people to follow the rules.

Keywords- IOT, PCS, LED, USIM

I. INTRODUCTION

Internet of Things (IOT) is connecting the environmental things to the network and to access those un-internet things from any location. IOT technology used in various fields of smart applications, but not yet found boundary constraints of this technology. Now a day the traffic becomes too severe because of over population along with that people started parking their vehicle near any street or at the NO PARKING area. This parking problem started due to many shopping malls that were built near main roads. When the parking area of the malls gets filled, people park their vehicle at no parking area. Due to this other vehicle can't pass that way, so the traffic becomes more severe. Every place traffic cop can't visit and see and this reason made the people to park in this area. The best solutions are the Smart parking and the Street parking. This system was introduced in foreign countries to reduce the parking problems in their cities and streets. The smart parking was used in malls and other hotel, which has already underground parking system in it. The street parking system are used to guide the driver to park in the free space in the street. These two systems provide solutions for the parking problems in malls.

II. LITERATURE SURVEY

In [1] authors proposed a smart parking system for detecting and finding the parked location of a consumer's vehicle using ultrasonic and magnetic sensor. The process of finding a vacant space in a parking lot has become very tedious nowadays. To ease the situation and help in finding the vacant spots, authors in [2] proposed a method implemented using Ultrasonic sensors, microcontrollers and LCD displays. Reservation-based Smart Parking System (RSPS) [3] allows drivers to effectively find and reserve the vacant parking spaces. This is also the latest technique which uses the smart phone to reserve the location to park the vehicle.

Advanced street parking system called Phone Parking using the GPS, accelerometer, and Bluetooth sensors on a traveller's mobile phone, in conjunction with geospatial data was discussed by authors in [4].

This paper [5] developed an android application, which is used to implement a prototype of Smart Parking System based on Reservation (SPSR) that allows drivers to effectively find and reserve the vacant parking spaces with the help of IOT (Internet of Things) with slot allocation method and performs automatic billing process. This paper [6] introduces an oval algorithm that increases the efficiency of the current cloud based smart parking system and development work architecture based on the Internet-of-Things technology. In parking control systems [7] only the administrator has information about the parking spaces occupied by vehicles. Since the existing parking system cannot use the active information exchanging [9][10], it did not provide useful parking information for drivers. To solve this problem, smart sensors and the middleware for handing them are needed. The vehicle parking location service has been proposed on the using of RFID devices. In this service, the drivers have to receive an RFID tag on the entrance of parking lot. The tag provides the vehicle location service for drivers through the RFID reader of parking space.

We propose a new smart Parking control System (PCS) to solve the problem of the exiting parking systems based on the wireless sensor network and Bluetooth of Smartphone. The proposed system uses ultrasonic sensors for indoor parking lots and a magnetic sensor for outdoor parking lots. For the location service of parking vehicles, the Bluetooth and USIM ID are exploited. It is used to sense the vehicle and report to the nearby cop and action will be taken on the specified person who parks his/her vehicle over there. The PMS is an electronic device with IR sensor in it to sense the motion of the vehicle. This PMS is fixed in the no parking

area. It senses the vehicle which stands before it. After 1 and half minutes, the LED light which is fixed with the sensor will be glowing to alert the driver that he is standing in no parking area. If the vehicle is not taken then the alert message is send to the traffic cop and action will be taken on that driver.

III.PROPOSED SYSTEM

A) Fixing a Sensor in the No Parking Area

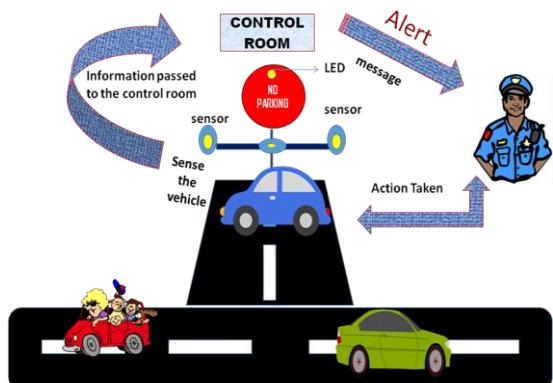


Figure 1. Architecture diagram for Parking control System

Figure 1 shows the Architecture diagram of the proposed Parking control System. It consists of
Sensor: Sensing the vehicle in the No Parking Area.
LED Light: To show an alert message
Control Room: To take necessary action against the driver. The proposed consists of two modules.

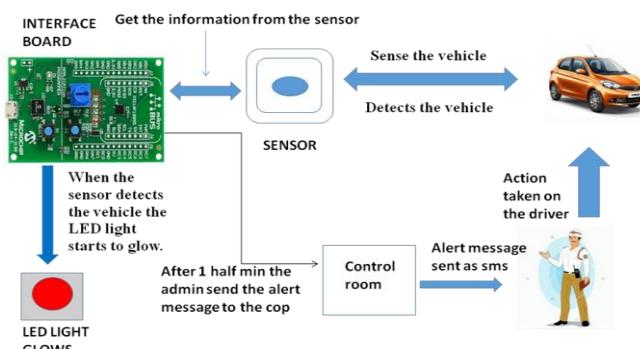


Figure 2.Fixing Sensor in No Parking

B) Detection of a Vehicle in the No Parking Area

Figure 2 shows fixing of a sensor in the No Parking area and detection of a vehicle there. Initially IR sensors are placed in three places in the no parking area. After that the admin in the control system generates the code for sensed object and sends detection message. This message was received through the interface board to the admin system. When the sensor senses the vehicle, the LED light which is fixed with the sensor will be glowing to alert the driver that he is standing in no parking area. If the vehicle is not taken, then the alert message is send by the admin to the traffic cop and

action will be taken on that driver. Raspberry Pi Foundation has announced a new version Raspberry Pi 3, with onboard Wi-Fi and Bluetooth support and 64bit improved Processor; Raspberry Pi v3 will be an exciting board for Makers, Engineers and Students.

IV.CONCLUSION AND FUTURE WORK

The proposed smart Parking control System (PCS) works by making communication between the smart phone and wireless sensor motes. It supports the identification of vehicles in the no parking slot. Compared to the previous method based on RFID, the proposed system incurs less implementation cost and also provides better detection of vehicles. In future PCS can be extended including accident alarm, recording camera, and so on.

V. REFERENCES

- [1] P. Kujur, L. Gautam, "Smart Interaction of Object on Internet of Things", International Journal of Computer Sciences and Engineering, Vol.3, Issue.2, pp.15-19, 2015.
- [2] L. Atzori, A. Iera, G. Morabito, "The internet of things: A survey", Computer networks, Vol.54, Issue.15, pp.2787-805, 2010.
- [3] PR. Shetgaonkar, "A Survey on Applications of Smart Sensor Networks in Building a Futuristic Smarter World", IJIRD, Vol.5 Issue.2, 29-34, 2016
- [4] M. Kang, "RFID based parking control on Smartphone", Journal of Security Engineering, Vol. 9, Issue.3, pp.24-26, 2012.
- [5] A. Gupta., S. Roy, "Design and Implementation of Visualizers for TinyOS", Procedia Technology, Vol.10, No.1, pp.409-416, 2013.
- [6] Y. Jo, J. Choi, I. Jung, "Traffic Information Acquisition System with Ultrasonic Sensors in Wireless Sensor Networks", International Journal of Distributed Sensor Networks, vol.10, Issue.5, pp.12-23, 2014.
- [7] Y. Jo, I. Jung, "Analysis of Vehicle Detection with WSN Based Ultrasonic Sensors". Sensors, vol.14, no.8, pp.14050-14069, 2014.
- [8] T. Matsuo, Y. Kaneko, M. Matano, "Introduction of intelligent vehicle detection sensors", Proceedings 199 IEEE/IEEJ/JSAI International Conference on Intelligent Transportation Systems, Tokyo, pp.709-713, 1999.
- [9] C. Park, Y. Jo, I. Jung, "Cooperative Processing Model for Wireless Sensor Networks", International Journal of Distributed Sensor Networks, vol.2013, Issue.2, pp.1-17, 2013.
- [10] C. Lee, Y. Han, "Smart Parking System for Internet of Things", IEEE Consumer Electronics, USA, pp.263-264, 2016.

Bibliography

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