

Detection of Illegal Parking

KianLam Tan

Computing & Creative Industry, Sultan Idris Education University, Tanjong Malim, Perak, Malaysia

Abstract: This project provides an answer to illegal parking. Large range of staffs is deployed to check for unauthorized parking and fine those owners. Be that as it may, proprietors avoid the fine by completely different illicit means like bribing the employees, threatening them and so forth. Towing vans got to manually scan for illegally parked vehicles. Here we have a tendency to propose a system that considers programmed unlawful parking discovery and alerting. The system consists of integrating a ZigBee and IOT modem in each vehicle. Zigbee, pic controller, the ultrasonic sensor is embedded in each area wherever parking is prohibited. Necessary quantity ultrasonic sensors are used until it covers the desired range. Whenever the vehicles are parked within the area (within ultrasonic radius), the ultrasonic detector detects the abstracted object (vehicle). Once this happens the PIC controller within the Platform unit initiates its Interrupt timer till the detected object is stationary. The vehicle is going to be checked perpetually by the sensor until the controller's timer runs out its default limit. If the vehicle is present stationary even after the programmed time limit, ZigBee in pavement sends signal to ZigBee in vehicle which is then received by pic controller. After that the pic controller sends the details to control room via IOT modem and can instantly alert authority. These communications that happen between the vehicle unit and the platform unit are carried out wirelessly through "Zigbee". IOT modem receives the information that's required to be sent to control room. Finally, the requested details are forwarded to the transport control room by the IOT modem in order that they'll directly reach the spot to take necessary action or send an alert to the vehicle's owner regarding the fine imposed.

Keywords: Illegal parking, automated parking offence detector.

1. INTRODUCTION

The parking is one of the important thing in the mind of the people who owns a car. If they need to move to any places in public the important thing is they need to park their car in the parking. But the problem they need to face is the low availability of the parking slots. As the cars are bigger than the motor cycles they need big spaces for the parking.

This situation leads the car users to park in the side pavements and also in the no parking places. This leads to the traffic jam in the places where more crowd moves on. The public places also do not increase their parking slots because only during weekends the cars are rushing. During other days the slots remain empty for most of time.

And some of the places collects some fare for the parking of the vehicles. Some users will stay for a minute or two who is also forced to pay the fare for the parking. So, this type of users is parking in the no parking places and at the pavement also. This leads to traffic jam in several places. By this illegal parking the other persons who follow the rules also need to suffer. So, we propose a new solution for finding the illegally parked cars and then report them to make the rules into action.

We also need to know some other things which is used in the normal world. Everyone will park the cars to take or drop the persons (in some countries). So, our system will detect those type of cars also. So, there lies a specific time limit for the system to send alert message to the car user. After the message delivery another counter will start. Before this counter the user must remove their car from that place. Else the car details are send to the control room. They take the necessary actions for the crime.

2. RELATED WORK

A. SMS Based System [1]

In this the author propose a system with which they use the SMS based system for parking the cars. For the purpose of the communication needs they use the GSM module. Using the SMS based system they park their cars. Our system holds good in the communication part with the help of Zigbee module.

B. Pressure Sensor [2]

The pressure sensors are used for finding whether the cars are parked is the ideology proposed in the paper by this

author. But this does not able to differentiate the obstacle and the car. So, the system sees a great backlog in this method. Our system has the advantage of the differentiating the car and the obstacle.

C. Parking Guidance and Information [3-5]

The paper proposes the ideology of providing the driver with various signs and symbols to make the cars park in the perfect place. So, the car parking is made easy. After the discovery of the cars the research for parking the cars also started. This also has a drawback if the users do not follow the rules this system will fail.

D. Occupancy State [6-9]

The paper researchers found that the solution for feeding the user with the available parking slot. This does not provide the better solution to the problem. The users in the hurry will not use this method and break the rules and park in the illegal places. Also due to the competition the other car drivers will park the car before others arrival. But our system will find exact one who illegally parked and report them.

E. Reservation based Distributed System [10]

This is wide range system which uses the concept of distributed system. The users use this for the purpose of reservations of the parking lots. If the car does not find any of the parking slot and car is parked then the car is parked illegally. This does not provide the better results as they may place the car in their own places which is legal. So this system finds the problem to find the exact illegally parked cars from the normally parked cars.

3. EXISTING SYSTEM

In the existing system they use the video cameras for the purpose of finding the illegally parked cars. In that system they analyse the video taken and then they will find the car which is parked in the illegal places. The person who parked the car is hard to find and also it is hard to find the car number sometimes. This may be due to the parking position of the car or due to any obstacles

in the path are some parameters which affect this system. Initially the process is done on the human supervision. This is a time consuming and cost inefficient task.

But later this was done with the help of computer with automation. This is also a very complex task and ineffective task. The chances of finding the vehicles is very low. The problem faced in this system is the finding of the no parking slots. Then another factor is finding of license plate.

A. Disadvantages of the System

- This system needs high cost to find these illegally parked cars
- Inefficiency to find the illegally parked cars
- It is hard to find the illegal parking slots and the road
- There lie many chances for the user to hide his identity by hiding behind obstacles
- More resources are required for finding the illegally parked cars

4. PROBLEM DEFINITION

The problem identified in the area is the cars parked illegally are the persons are escaping from the laws. So, there needs another different solution to make this problem towards the end. Moreover, the persons who follows the rules also gets affected by the act of parking cars in illegal places indirectly. This indirect action takes place due to the traffic jam happening in that places by the illegally parked cars. Also, for finding these culprits they use highly complex and inefficient system. So, we propose a new solution for solving this problem.

5. PROPOSED SOLUTION

To wrap the illegal parking, we propose a new solution by which all the cars which are illegally parked are found and intimidated. If they violate the rules then the person details are provided to the police department. They take the necessary steps and this will make the user not to park the cars in illegal slots. The simple architecture of the system is shown in the Fig 1.

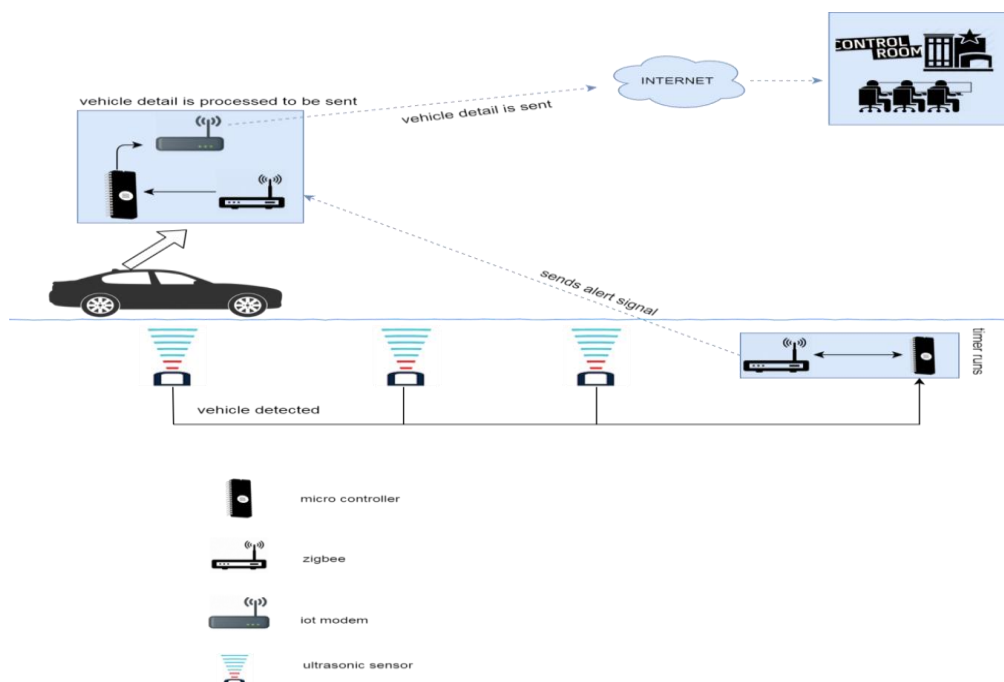


Figure 1. System Architecture for finding the illegally parked cars

There lie several units which is powered by IOT for the purpose of finding the illegally parked vehicles. This system is made to get succeed by making following several steps.

First, we need to assign a unique identification number for every vehicle. This number should be embedded in the vehicle and the details for this number should be in our base.

Secondly, the onboard unit holds this information about the unique identification number. In this onboard unit also lies some other hardware for the purpose of communication. The hardware used are LCD display, Zigbee and also the PIC microcontroller. The important thing needed for the purpose of the stopping some illegal things is very essential. The user may fake his number to get escape from the hands of law. So, we make ensure that the thing the unique number can be printed only once be using some of the Read Only Devices. This reduces the forgery. Also, we add some additional feature into the onboard unit that this part is not easily accessible by the users. If it is easily seen by the user then they can remove it easily so to escape from the crime. This must be done on the manufacturer side.

Then we need to fix the roadside units on the pavements and on other places where the driver of the car is prohibited to park the car. The roadside unit consist of Zigbee, ultrasonic sensor and PIC microcontroller. This unit is responsible for the purpose of finding the illegally parked cars. Using the sensor, it detects for any obstacle.

If anything is found then it needs to confirm that this obstacle is illegally parked car. So, we use the Zigbee for the conformation. If it gets confirmed then this unit gets the car details and send an alert message to the car. If they did not get on certain time limit then the information is passed to the police department.

A. Internet of Things

Internet of things is the networking of the hardware available all over the environment. This hardware may include the any type of devices, machines etc. They are made into network with the help of the embedded system. They have the sensors which act as the input for these IoT devices. They also have the actuators for the purpose of the process back.

The advantage of the IoT is now currently for the main thing of surveillance, remote control, remote sensing. So, the internet of things is generally used for the purpose of using the remote things.

We use this internet of things in the Intelligent transport system for the purpose of finding the illegally parked cars. They also have some sensors and some embedded chips to make our goal a successful one.

B. LCD display

A liquid crystal display (LCD) is a output device which is used in this project. This is used for the purpose of

displaying the information. This LCD displays are used by replacing the LED displays as they are efficient compared to them.

In this project we need to interface the LCD with the microcontroller for the purpose of getting the results. The LCD interface drawing is shown in the fig 2.

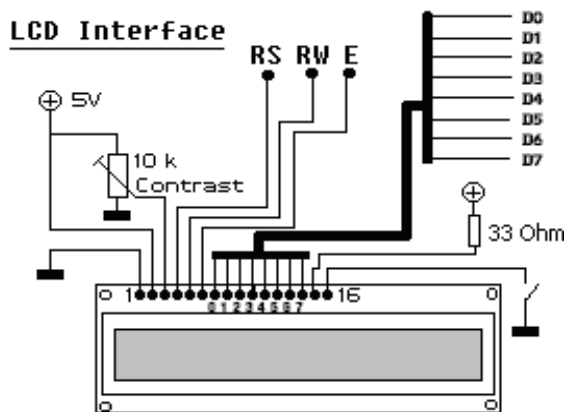


Figure 2. LCD interface

Now for the purpose of the interfacing with the microcontroller we need to first choose the type of LCD interface we are using. Then we need to connect it to the required pin in the interface and the microcontroller.

C. Zigbee

This is used for the purpose of the communication in the system. This device defines the network and application

layer in the network. The usage of the device is mainly for the communication between the devices in the internet of things. The Zigbee is running on the basis of several protocols by which the required result is made possible. The layers of the Zigbee is shown in the fig 3.

ZigBee is an established set of specifications for wireless personal area networking (WPAN) i.e., digital radio connections between computers and related devices. ZigBee is one of the global standards of communication protocol formulated by the relevant task force under the IEEE 802.15 Wireless Networking Standards. ZigBee provides specifications for devices that have low data rates, consume very low power and are thus characterized by long battery life.

The protocols used by this device is the Adhoc on demand distance vector routing. These ZigBee protocols support beacon and non-beacon enabled networks. Putting away a huge number of transistors into one chip. That was an essential for generation of microchips, and the principal PCs were made by including outside peripherals, for example, memory, input-yield lines, clocks and other. Additionally, expanding of the volume of the bundle brought about production of incorporated circuits. These incorporated circuits contained both processor and peripherals. That is the means by which the primary chip containing a microcomputer, or what might later be known as a microcontroller came to fruition.

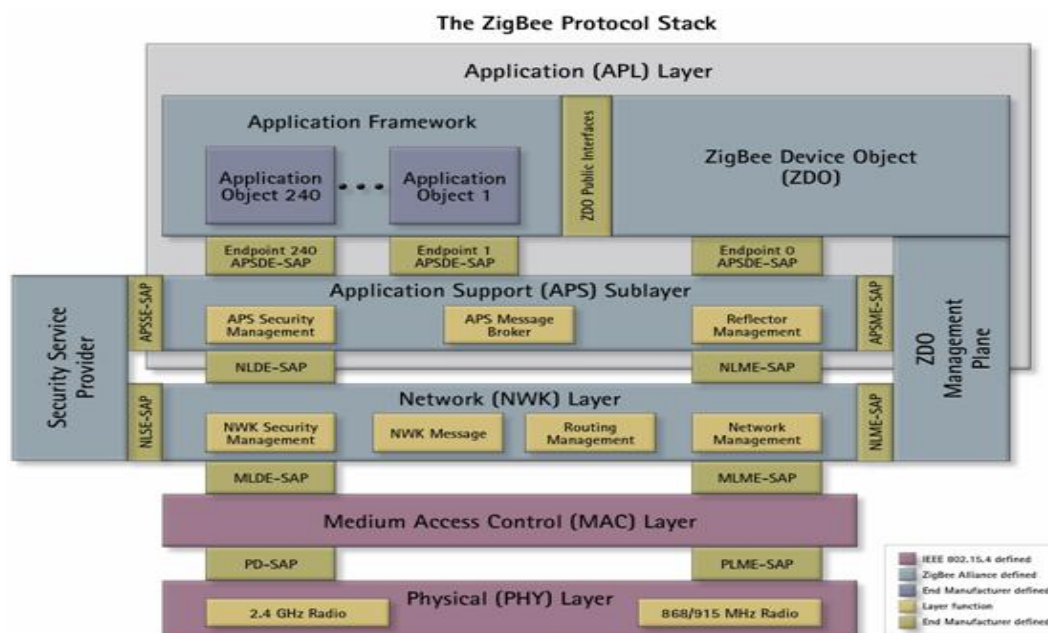


Figure 3. Zigbee protocol

D. PIC Microcontroller

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E. Ultrasonic Sensor

This sensor is used in the field of robotics for the purpose of the obstacle detection and also for the distance between obstacle detection. The image of ultrasonic

sensor is given in the fig 4. This sensor is used in the purpose of finding the cars in the illegally parked places. So, the parked car details can be got and reported to microcontroller.



Figure 4. Ultrasonic sensor

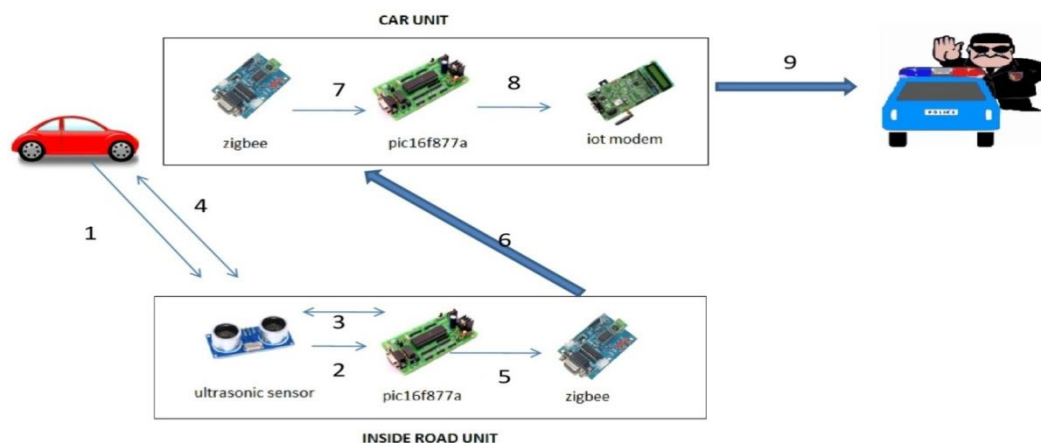


Figure 5. Flow control in system

F. Advantages of the system

- Efficient finding of the illegally parked cars
- Better system so the criminals cannot escape from the hands of law
- Reduce the traffic jam due to the illegally parked cars
- None will park the car in illegal places if done they will face the thing for their act

6. IMPLEMENTATION

The system is implemented in the IoT environment with the help of the sensors and the simple architecture is used for the purpose of the deriving the implementation flow diagram which helps us to understand the system in easy manner. The flow diagram is shown in fig 5.

Later the connections are given and the system is tested and the output is displayed which shows the illegally parked user list which is shown in fig 6.

ID	Name	Vehicle_No	Time
17	Illegally_Parked		01/07/2018 14:07:14
18	Name_Krishna		01/07/2018 14:07:18
19	Illegally_Parked		01/07/2018 14:08:03
40	Vehicle_No_TH02_7417		01/07/2018 14:08:29
41	Name_Krishna		01/07/2018 14:08:54
42	Illegally_Parked		01/07/2018 14:09:18
43			01/07/2018 14:10:00
44			01/07/2018 14:10:29
45	Vehicle_No_TH02_1515		01/07/2018 14:10:36
46	Name_Krishna		01/07/2018 14:11:15
47	Illegally_Parked		01/07/2018 14:11:40
48	Vehicle_No_AP15_1888		01/07/2018 14:12:06
49	Name_Ruben		01/07/2018 14:12:30
70	Illegally_Parked		01/07/2018 14:12:55
71			01/07/2018 14:13:20
72			01/07/2018 14:13:46
73	Vehicle_No_TH02_7417		01/07/2018 14:14:11
74	Name_Krishna		01/07/2018 14:14:36
75	Illegally_Parked		01/07/2018 14:15:01
76	Vehicle_No_TH02_1515		01/07/2018 14:15:27
77	Name_Ruben		01/07/2018 14:15:51
78	Illegally_Parked		01/07/2018 14:16:16
79	Vehicle_No_TH02_7417		01/07/2018 14:16:42

Figure 6. Illegally parked user list

7. CONCLUSION AND FUTURE ENHANCEMENT

The paper is used for the purpose of finding the illegally parked cars and the owners of the cars are fined for their act. This made the police to make their job ease and the system is used for finding the details of the culprits in ease. In future this system can be used to find the parking lot availability by making some further changes. By this the traffic jam may reduce and the car drivers can easily get their lots in ease.

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