ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 3, March 2018

Implementation Paper on Smart Parking System

Padmaja Phanse, Diksha Ranpise , Prashant Bhujbal, Prof. Deepa S. Nath

Department of Electronics and Telecommunication Engineering, MIT College of Engineering , Kothrud , Pune, India

ABSTRACT: In recent times the number of vehicles is consistently rising and parking space is becoming a major issue in urban and semi urban cities so there is a need to design a parking system which will reduce manual work as well as reduce the problem of cars parking on streets. Since in modern world, where space has become a very big problem and in the era of miniaturization it has become very important to avoid the wastage of space in modern, big companies and apartments etc. Automatic Car Parking enables the parking of vehicles-floor after floor and thus reducing the space used. In this report we have implemented the concept of smart car parking system. As we see in the modern world everything is going in automation, here we have deployed an automatic Arduino based system which is used to sense the presence & movement of vehicles and depending on availability of space it allows parking and same is displayed on web based GUI. Camera is used to detect the presence of vehicle in parking slot. There is also RFID module that will provide security as users who have authority can swap the RFID cards and get entry otherwise. This project is designed for automatically parking a vehicle into the desired parking spot.

KEYWORDS: OpenCV, RFID(radio frequency identification), GUI(graphical user interface), IoT.

I. INTRODUCTION

Due to rapid increase in the vehicles there exists a problem for parking of vehicles. It leads to traffic congestion and also pollution. So we have a need to maintain the vehicle park management in order to reduce the wastage of time. If we see in the larger cities when we visit the shopping malls or tourist places or any other commercial areas there arises a problem for parking of our vehicle. We have so different methods of parking systems such as using WSN method, etc.

Internet of Things (IOT) is used to communicate with the devices. By using this devices could be controlled or monitored through the internet, IOT acts as a platform to store data from the remote locations. IOT consists of web enabled devices that collects the data from the surrounding environments using processors, sensors and other communication devices. The device could be monitored and tracked using computers connected through internet. There are different types of car parking system available to reduce the time and the traffic congestion. The types used in day to day life are by using cameras, parking space is detected and the camera is fixed at the parking area pillars then another method is by using laser beams it detects the corner and target parking position. Then another method is by using Light Detection and Ranging sensors. Another method is based on the 3D reconstruction. With the latest proliferation of the vehicle availability finding the parking place availability is more difficult. Car parking is a main problem because of increasing in the vehicle number. Searching of a parking place around the cities is the routine work. In the smart parking system the parking space information is available at the real time. But the major drawback of those systems is they help us to find the available spaces for parking but not the exact location of those spaces. It can be overcome by using smart parking system. Available parking space will be given to the driver to park their vehicle and availability of the parking space will be renewed. An IR sensor, RFID and IoT technology used for implementing the smart car parking system. By having obstacle detection, the particular vehicle parks vacant can be known and then used to guide a driver to park vehicle in empty slot. All parking related information such as empty slots, vehicle parked count, etc details will be shown on web based GUI and vehicle details will be saved into database.

The main objectives of the vehicle parking system are:

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 3, March 2018

a) Design and fabricate a vehicle parking system and to design and fabricate a cost-effective model, to develop a fully automated control system and to prevent illegally parked vehicles.
b) Count, display available parking space and the location of the available parking spaces in parking lot will be known through mobile application.
c) Attendance of vehicle i.e. vehicle no, vehicle owner name and vehicle entry time and exit time will be saved into the database.

II. RELATED WORKS

Vehicle parking place is one of the major problem in day to day life and it is indirectly leads to the traffic congestion. This paper presents the IOT based parking place detection using the mobile app. The user can able to check the nearest parking place availability and reserve the parking slot using mobile application. The mobile application will act as an interface between the end user and the system. Infrared sensor is placed at the parking slot along with the Arduino. Infrared sensor is used to detect whether the slot is occupied or empty and it is updated to the cloud using the GSM. Arduino is used to track the number of vehicles parked in the parking area. In this project Infrared sensor is used in every parking slot. The obtained details are sending to the server using GSM from the Arduino board [1].In this system first, the driver arrives at entrance and takes the parking ticket. Then, the driver may follow the assigned parking spaces (with parking lot ID) that printed on the ticket to park his vehicle. If there is available, means there is an empty parking space, driver may park their vehicle and proceed to the shopping mall. This system is used to effectively manage, monitor and protect the parking facilities, Android application is used to facilitate the drivers in remembering their parking slot, however, No facilities for searchers of vacant parking space and the system is limited in short distance since it doesn't give any information to the incoming drivers about the current situation of the parking lots [2].The system designed with Arduino controller automatically identifies the empty slot and parks the car at the corresponding slot. The System embedded with a RFID smart card helps us to calculate the time period during which the car is parked, thus helping an automatic e-commerce system to deduct the amount for the mentioned time period from the users account. The system has a GSM add-on module which will automatically respond's to the users SMS request by letting him the available slots at a given time. Temp Sensors, CO2 sensor are used to indicating the security aspects in the overall parking system [3].In Smart Card Based Parking System, when a car arrives in parking lot, it is automatically allotted a parking space. Space is allotted considering the best spot with respect to least walking distance of the parking spot from the elevator, parking type(slash/perpendicular/ parallel parking), security(coverage of spot by a camera). A user can record his preference through a website/mobile app, otherwise, default preference is considered. Default considers all preference criterion and allocates the best available. As soon as the car is parked, a message is sent to the car owner about the parking location of the car, which helps a person to remember where he had parked his car [4].

III. PROPOSED ARCHITECTURE

The figure below shows the block diagram for Smart parking system.This system uses camera for detecting presence of vehicle on slot. OpenCV software is used for processing image detected by camera. Camera is connected to Raspberry pi. The main workings of sensor are to sense the car and to send the signal to the microcontroller. After that microcontroller take proper action. RFID reader used to detect the details of vehicle i.e. car number, owner name, etc. It will show the no of busy parking slot, empty slot on web based GUI. If all slots present are full then it will show slot not empty message on GUI. RFID reader captures the details about vehicle using RFID tag.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 3, March 2018

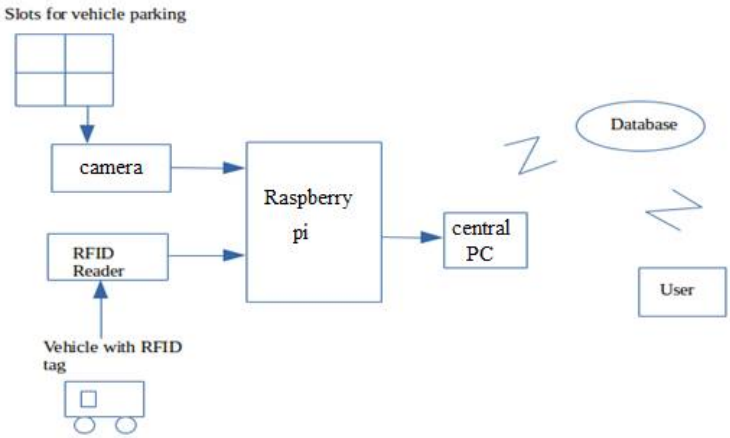

Fig.1. Block Diagram of proposed system

IV. SYSTEM ALGORITHM

We propose an algorithm to describe the operation of the system.

a. ALGORITHM

Below is the algorithm of the proposed system

Step 1 Initialize the system.
Step 1 Is camera detects the parking lot.
Step 2 If NO then go back to step 2.
Step 3 Enter car in parking area.
Step 4 Read data about vehicle like vehicle no. in-time etc using RFID.
Step 5 Is RFID tags is not valid? If yes then enter this as new entry in database.
Step 6 Display in registration form.
Step 7 Display out-time on web.
Step 8 Stop

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 3, March 2018

b. FLOW CHART

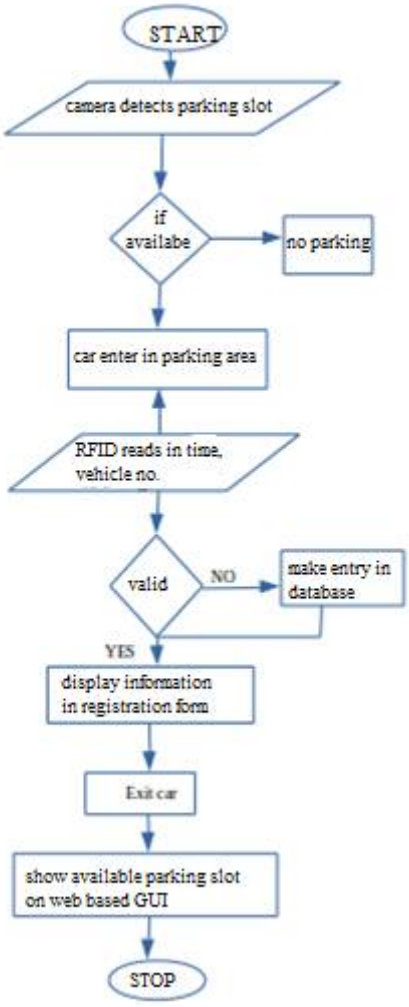

Fig 2 Flow of system operation

Camera continuously monitors the parking slots and if it detects any empty slot then convey this information to the main controller. Each vehicle has RFID tag so when it enters into the entrance of parking area the RFID reader reads vehicle no. it's in time and owner information. If this information already exist in database then it allows car in parking zone otherwise it will first its information as newcomer and then allow its entry.

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 3, March 2018

V. RESULT

a. HARDWARE MODEL

Fig 3Hardware model of the system

b. WEB PAGE

Fig 4: Web Page Result

ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijircce.com

Vol. 6, Issue 3, March 2018

VI. CONCLUSION

Automatic car parking system is very important factor in the traffic areas. It can be automated without human being. It reduces the time consumption. So by implementing our smart parking system using camera and RFID we can manage our time and vehicles can be parked easily. It will be save the details about the number of current available parking lots, not available parking lot and car enter and exit time in database as well show all such information o web based GUI.

REFERENCES

[1] Yuvaraju. M, Monika. M, "IOT BASED VEHICLE PARKING PLACE DETECTION USING ARDUINO", IJESRT, ISSN: 2277-9655, May, 2017.
[2] Ndayambaje Moses, Y. D. Chincholkar, "Smart Parking System for Monitoring Vacant Parking", International Journal of Advanced Research in Computer and Communication Engineering Vol. 5, Issue 6, June 2016.
[3] Vatsala Daur, Prerit Bhandari, Laxay Jain, Nalini N, "Smart Car Parking System", IJARCSSE, Volume 6, Issue 5, May 2016.
[4] D.Sathya, S.Kumaresan, "SMART-PARKING SYSTEM BASED ON RFID AND GSM TECHNOLOGY",International Journal of Scientific & Engineering Research Volume 8, Issue 5, ISSN 2229-5518, May-2017.
[5] K.Sushma P. Raveendra Babu, J. Nageshwara Reddy, "Reservation Based Vehicle Parking System Using GSM and RFID Technology", K.Sushma et al. Int. Journal of Engineering Research and Applications, Vol. 3, Issue 5, Sep-Oct 2013, pp.495-498.