Survey Paper on Internet of Things Based Smart Vehicular Parking System

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ABSTRACT: The Internet of Things (IoT) offers the client consistent interoperability and availability between gadgets, frameworks, administrations, different systems, and specifically control frameworks. End clients hope to interface rapidly and straightforwardly by means of any endpoint gadget. This paper introduces a model that consolidates the capacities of keen IoT gadgets with control framework doors utilizing ongoing test reaction for secure control operations in stopping zone. A suitable shortest path algorithm is used to find the minimum distance between the user and each parking slot in the system. Thus, the waiting time of the user is minimized. Android application is used for the interaction between the Smart Parking system and the user. RFID technology is employed during this system to avoid the human intervention that minimizes the value.

KEYWORDS: Information Search and Retrieval, Clustering, Information filters. Selection process

I.INTRODUCTION

The evolution of the industrial Internet of Things (IoT) creates the possibility of connecting computer automated control systems for remote monitoring and rapid response to events requiring real-time handling. In the IoT world, Control commands can be issued instantly from a client device, such as PC, tablet, or cell phone, to anywhere in a given facility. This ability to respond immediately from any location can prevent time lost as well as remote access facilities. With this new ability, however, comes an increased security risk, notably by an attacker obtaining unauthorized access and changing a system, issuing inappropriate commands, causing theft or unsecured vehicle authentication. Today, control systems are increasingly being connected to the IoT world via gateways. These control system gateways allow for simultaneous control of multiple industry environments, including factories, automated facilities, medical, and transportation systems.Gateway devices also simplify and unify the management interfaces of complex control devices. Control system gateways with sufficient compute power can also be used with modern IoT client devices to help manage the security challenges of remote access and control. Using cloud services with a control system gateway for managing security is an increasingly used approach. Due to the growth in gateway computational power and increased storage/memory space as well as improvements in client device security capabilities advanced gateways are now able to manage the remote access security requirements directly from IoT client devices. Having both a cloud option and a directly connected option opens the control systems to many new capabilities, modalities, and also introduces new challenges.In this system we used Raspberry pi module as hardware controller unit, system is implemented based on python programming. There are some module interfaces with raspberry pi to implement appropriate output. In this Infrared sensor is used to monitor the vehicle is present in parking slot or not by updating the status into to web application , camera is used for capturing the image of vehicle to identify the vehicle details which is maintained in RTO office database. due to this, system can identify the vehicle details as well as the information about the owner of vehicle. This is helpful for verification of vehicle as well as identifies the theft vehicle. Theft vehicle entry is updated in our system to match & compare the current vehicle entry is present in list or not. software part is implemented in using web application to for secure & reliable accessing of device. In this part we provide the facility to remotely reserve the parking slot with time functionality and also much alternation functionality to customer.

II. RELATED WORK

S.no	Title of Paper	Authors Proposed	Improved Technology
1.	An Algorithm of Parking Planning for Smart Parking System [1]	The method proposed can give timely and efficient guide information to vehicles for a real time smart parking system.	Time related functionality are improved in this system
2.	Rapid Development of Smart Parking System with Cloud-based Platforms [2]	In this paper gain rapid development of smart-parking system. Furthermore, the integration of parking sensor with IOT midd	Rapid development of smart parking system in cloud computing
3.	Android based Smart Parking System using SlotAllocation &Reservation [3]	System designed to conserve a space as each vehicle to be on the problem of parking using slot allocation method. This paper proposes a android application which is used to implement a prototype of SmartParking System based on Reservation (SPSR)	Parking system based on reservation is implemented on web application.
4.	A Smart Parking System Based on IoT Protocols and Emerging Enabling Technologi	Customized software application, installed on a cloud platform, is able to manage silent events (e.g. improper use of a reserved space or expiration of the purchased time).	Improve the functionality like improper use of reserved space or expiration of time
5.	Automatic Smart Parking System using Internet of Things (IOT) [5]	it mainly focus on reducing the time it finding the parking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area. This also has the led consumption which in turn reduces carbon footprints in our atmosphere.	Provide footprints of an atmosphere & slot to the vehicle owner.
6.	Online Intelligent Demand Mgmt of Plug-In Electric Vehicles in Future Smart Parking Lots [6]	Have shorter parking duration and higher required charging time, the proposed solution outperforms in more robust energy delivery to the EV and, accordingly, more satisfaction for the owner.	Find shortest parking area for the owner
7.	Smart Parking: Parking Occupancy Monitoring and Visualization System for Smart	The commercial and time costs associated with traffic jams, not associated with wasted gas fuel, and time looking for an empty parking space that are caused by inefficient parking will be significant reduced.	Cost effectiveness concept is removed by considering the many things
8.	Smart Parking Management System Using RFID and OCR [8]	This system if largely designed to last. It is a secure system as it orients the computer for search, having platform independent to the project and ensure no operating system. This system could be a profit of user if data for security and the identification	Web technology is implemented in java for more security
9.	A Smart Parking System using WiFi and Wireless Sensor Network [9]	In this system, geomagnetic sensors are used to detect the occupation of parking spaces, and WiFi is used for navigation. A prototype system has been developed.	Wireless sensor network is implemented using Wifi module
10.	Image Processing Based Real Time Vehicle Theft Detection And Prevention System [10]	As the photos are taken in real time, several problems like unequal illumina algorithms are incorporated along with basic	Image processing is implemented for vehicle identification

III. EXISTING SYSTEM APPROACH

The existing system maintain the low level security for identify the theft as well as the vehicle related information.[10] In this model used traditional observation for monitor the vehicle documentary. License & vehicle documentation is used to get the detail of the vehicle related information which is time consuming task. In recent the mobile apps are implemented for parking system which will give the limited functionality & not more secure for recognize the vehicle & owner related information is not implemented. In model low level wireless sensor s are used to communicate with remote device like GSM modem, zigbee module etc.[13] which have many disadvantage about security as well as the range between the hardware module & remote devices. Remote system is based on android apps which is operated by mobile. Mobile app have ability to reserve the parking slot. System is based on the android application not fully the web application to maintain the security.

Disadvantage
  I.   *Vehicle authentication is not implemented.*
  II.   *Not fully automated implementation & less functionality covers.*
  III. *Not suitable for cloud based web server.*

IV. TAXONOMIAL CHART

Survey paper	Scalability	Reliability	Cost effectiveness	Maintenance
11.An Intelligent Car Park Management System based on Wireless Sensor Networks	Yes	Yes	No	Yes
12.The Research and Implement of the Intelligent Parking Reservation Management System Based on ZigBee Technology.	Yes	Yes	No	Yes

13.A New "Smart Parking" System Based on Optimal Resource Allocation and Reservations.	No	Yes	Yes	No
14.Intelligent Parking Lot Application Using Wireless Sensor Networks	No	Yes	Yes	No
15.Intelligent Car Park Management System using Wireless Sensor Network	Yes	Yes	Yes	No
16.Smart Parking Techniques Based on Internet of things	No	Yes	Yes	Yes

A research by Vanessa W.S. Tang et al employs a WSN-based intelligent car parking system using the crossbow motes products[11] and the extended Crossbow XMesh networks architecture[11]. In their system, the nodes are equipped with Wireless sensor to manage system. The status of the parking field is detected by sensor nodes which are reported periodically to a database. The information about the parking field is given to the managers and administratorsusing the management system.

In an another research done by Cui Shiyao et al proposed a system of a smart parking composed of ZigBee network which sends the user requested data to computer through an organizer and further updates the information in database [13]. Using the internet, the parking data is given to the application layer.

In another paper by YanfengGeng et al(2011) proposed a new "smart parking" system that assigns and reserves an optimal resource based on the user's objective function that combines adjacency to destination and parking cost, so that the overall parking capacity is efficiently utilized. It solves a problem of Mixed Integer Linear Program (MILP) [14] at each decision point in a time-driven sequence. The allocation is updated at the next decision point ensuring that there is no resource reservation conflict and that no user is ever assigned a resource with higher than the current cost function value.

ManishaBhendeet al[16] in their paper they proposed a Car Park management system which is a highly integrated WSN used for sensing events such as car moment, intruders or any physical change The system contains RFID Tag and RFID Reader that powerfully give the safety for the aim of authentication of valid user to park the automotive.. It has a three-tier architecture in which Tier 1 is used as monitoring system. Sensing and processing is done by tier 2 and in tier 3 the complete information sent by sensors stored in database server in architecture. Administrators do management and planning of user information.

V. CONCLUSION

In this paper, the implementation of WSN smart parking system using Internet of Things isdiscussed. This system includes RFID technology with interactive Android application which provides userinterface for system and users. The typical waiting time of users for parking theirvehicles is effectively reduced during this system. The optimal solution is provided by the proposedsystem, where most of the vehicles find a free parking space successfully. This smart parking systemprovides better performance, low cost and efficient large scale parking system. Security measure toensure that the users do not misuse the parking system can be implemented.

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