

# An Analysis Of Smart Car Parking Management System

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**Abstract:** In Recent Years, the IOT is the forthcoming technology used to solve numerous problems and use it for the current deployment of the smart car parking system. The smart car parking system is quite new scheme which generates a stage for reserving the parking slots and efficiently uses the parking slots. The objective of the smart car parking system is to create the parking slots easier for the client to select the best slot as per their convenient in a rapid way. This paper examined about the different approaches used to investigate the smart car parking system.

Keywords: Internet of Things (IOT), Wireless Sensor System (WSN), Global Positioning system (GPS).

## 1 INTRODUCTION:

IOT usage is gradually gaining prominence in the legitimate world due to the rapid development of advances in mobile computing, wireless architecture, remote architecture, distributed computing and more. The Web of Things interconnects creatures and inanimate creatures, creating a correspondence between virtual and non-virtual information. Along these lines, there is a lot of information generated by a number of different centers connected via the Internet. From that point forward, important data must be transferred from the information set. WSN accepts a basic job in improving IOT. The smart city idea is the best reasonable model for reconciling IOT and WSN with ICT. Savvy City provides a driving force for major and effective improvements to all intersections, for example, human services, transportation, commerce and more. It uses IOT in a compelling and secure way to obtain the article's IP address, and creates the correspondence interface between the article and the structure with the help of the Internet.

## 2 RELATED WORK:

There are numerous advancements are utilized in brilliant stopping framework. There are recorded beneath with some short portrayal of every strategy.

### a. Wireless sensor systems based frameworks

These types of frameworks have created expanded enthusiasm for researchers since 2005. Because distant sensor systems have different focal points, they are the most well-known process in recent decades with researchers, for example, adaptive, intelligent, sensible cost, fast system, and detection, which as a rule have sensor centres. The accompanying documents talk about the WSN-based stopping structure, this kind of framework that uses sensors to screen natural conditions, especially in the intelligent community, because of the simplicity and sensible cost of installation and design. The structure used for cross bow products is that they have lower unit costs.

This framework empowers a vehicle to recognize the vehicle to the park, and efficiently guides the driver to an empty parking lot, which introduces another fantastic exit structure using an ultrasonic detector with signs shown to the driver. [1] A sensor is fixed on the roof for each individual vehicle leave and each parking space. Ultrasonic sensors operate on the echo location. The sensor transmits a sound, strikes a strong object (vehicle or turf) and responds back to the sensor, talked about the challenges of identifying with stopping innovation and proposed some possible arrangements. In a stacked arrangement, a few autos are also decorated with ultrasonic sensors, which allow people to cross the parking spaces and transfer information to a coordinated database. Vehicles that have to exit are questioning the database that is put together. Vehicles that need to interrogate the combined database proposed the use of a combination of attractive and ultrasonic sensors for accurate and solid identification of vehicles in the parking garage, and portrayed an adjusted description of the minimum and maximum computations for the invention. Vehicles that use magnetometers [3].

### b. Smart stopping frameworks dependent on Vehicular to foundation correspondence (V2I)

Different choices have been proposed to use the term (CVT) to refer to connected vehicle technology that relies on remote communication of vehicle and architecture (V2). This promising innovation has recently risen. [2] It proposes another intelligent parking strategy, which is to use another vanity-based parking lot for avid guidance and intelligent parking. It refers to vehicle communication systems, the vehicles and the roadside units, which are centres of expression, meaning that they offer to each other and trade data, for example, up to raise awareness of well-being and the provision of data or traffic obstruction in any event, have found the empty vehicle slots. Basically, vehicle systems are considered to have two types of hubs: vehicles and a roadside station Both are classified under the term 'Communicated Short Range Communications' (DSRC) gadgets. The DSRC 5.9 GHz groups have 75 MHz of data transfer capacity and approximately 1000 mHz. It is a two-way strategy for correspondence, including vehicle-to-infrastructure (V2I) and infrastructure-to-vehicle (I2V) correspondence. The "Intelligent parking" framework includes letters to the V2, drivers sending their parking requests, providing driver data and confirming that reservation to the structure. The I2V correspondence includes the results of the TRPC sending part, driving bearings, installments, and the sky returning to the vehicles. It is worth noting that cell systems are commonly used in V2

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and I2V arrangements, and they proposed a new stop structure called SPARK, which comprises four categories: structure setting, continuous stopping, hostility to predatory insurance, and acceptable data dissemination [4]. In, the SPARK plot is used to observe and deal with the entire parking area using the RSUs of a parking area using VANET correspondence. This framework uses light sensors, and in the proposed SPARK plot, the entire parking area is under the supervision of the three parking area. This framework allows GPS to detect roadside units and stop traffic messages.

#### **c. Smart stopping frameworks dependent on Global Positioning Systems GPS**

Global Positioning Systems (GPS) innovation is used to determine and follow the exact part of a vehicle. In this area, it is used to provide data on access to destination and parking spaces. This method is proposed to show a part-based structure called NAPA. The server in the builder builds the configurations on the ground with parking garages on request to split the structure. Upon finding the closest accessible parking garage, the client sends the message he / she has stopped to the Napa server. At that point the server updates the data about the parcel properly. When the customer exits the parking area, using SMS administrations to propose another avid parking structure, NAPA Server can charge the right parking costs. This structure is suitable for identifying parking spaces in exposed parking areas. A parking reservation structure has been developed for customers to book their parking spaces through GPS and Short Message Management (SMS) [5]. SMS is handled by a small-scale RTU (Remote Terminal Unit) remote correspondence tool gadget. Details are in line with the proposed model; The circuit has a straightforward plan, the unchanged quality is high, and the accuracy of the structure is excellent. Of late, many researchers have focused on these techniques. This research field includes strategies for obtaining, manipulating, and breaking images. It uses PCs, which include learning to perform tasks and the willingness to perform exclusions, and to take functions that depend on visual sources of information, in addition to what is known as PC vision. The purpose of PC viewing is to enable PCs to efficiently view and process visual information, for example, images and records, and to track changes in these images. Typically, this practice involves breaking a margin every second and then sending information to a focal database, after which the customer can retrieve data on improvements in the parking garage. In, their structure allows CCTV to be used in a vehicle identification stream to differentiate the proximity of a vehicle or vehicle to a specific parking area. Pixel recognition is used to identify the proximity of a vehicle to each parking area. In grayscale, a certain number of pixels is used as a limit for separating pixels from the vehicle and the empty parcel. Another exit structure, called CCTV, uses images to identify exit locations. In any case, these strategies can misidentify left vehicles. The framework focuses on situations where people need values [6]. Reliability is high and the structure is perfect; nevertheless, all the different parameters are ambiguous on paper and proposed a framework that uses CCTV cameras fitted in vehicle parks to naturally differentiate parking spaces. In any case, these techniques are not always accurate in situations where people's values are required. (Bong et al.

2008) proposed a study that was developed to acquire automobile residency data. The impetus for creating this framework stems from the fact that the cost of image manipulation is used in the light of the fact that image manipulation techniques are used instead of sensor-based systems. This work is called the Car-Park Occupational Information System (COINS).

#### **d. Smart stopping frameworks dependent on RFID innovation**

This innovation (RFID) is proposed in the accompanying chosen frameworks. In numerous scholarly papers, savvy stopping's RFID arrangements make it conceivable to oversee license stopping effectively, particularly in the model stages. The principle component of RFID innovation relies upon an electromagnetic field to distinguish and follow labels appended to objects naturally. utilized RFID innovation in mechanization Their framework uses a product plan to change and notify the location of the parking space, and for the functions of the company, for example, selecting a nearby empty parking space, it sends the report to the driver at the time[7]. Meanwhile, the Gateway PC-Controller and Embedded Gate Hardware proposed a framework that included an RFID system and a modular parking management platform: "Most of the configurations in the modular RFID parking management system can be adjusted and replaced with some other comparable configurations or devices".

#### **e. Other cross type Algorithm based, M2M, IOT Systems**

Utilize specific sorts of cross breed strategies and blended techniques. As referenced before, it is hard to arrange each type with a specific gathering, yet it is helpful to do as such for lucidity proposed a brilliant framework that recognizes and finds the stopped area however frameworks dependent on IOT, shrewd sensors, and actuators, with the middleware interfacing customers with terminal gadgets. The framework is subject to Bluetooth correspondence between advanced mobile phone and remote sensor bits, using camera centers and a clever vehicle exit model and open CV. The calculation is also proposed. And implementing an M2M app for executives in the street transport industry. This investigation used the framework of an integrated IOT retractable Pollard administrator to enable vehicle access to limited city zones, in light of the standard foundation and programming units; The creators have envisioned a virgin parallel system, using RFID invention using fluffy rational controllers and two ultrasound extension sensors. The architecture includes a Gateway PC controller and embedded gate hardware, an RFID system and a modular parking management platform. As already mentioned, most of the configurations in a modular RFID parking management system have been altered and can be substituted for some other similar configuration or device. Finally, the registration and inspection of parking areas are under the influence of RFID, with an inspector, names and barriers. The parking area will be displayed as a matrix, and plans are proposed to aggregate the data and spread it over the network. In addition, the discovery of the M2M architecture has emerged as a powerful empowering influence for the advancement of new arrangements in numerous IOT application spaces, including transportation, medical services, eager biosafety, intelligent use measurement, delivery and delivery, urban robotization,

Assembly and others. M2M employs direct letters that are exceptionally convertible on remotely authorized multicast terminals known as M2M devices [8]. Basically, the leader of M2M applications that acknowledges M2M correspondence involves four phases: 1) classification of information, 2) dissemination of open information by organizing a letter, 3) evaluation of information and 4) reaction to accessible data. Each of these resolutions has attracted M2M's involvement in the curious parking structure. The M2M rendering design for IOT availability uses aggregation gadgets to serve different endpoints [9]. One-door interfaces with the cell make for an inevitable Internet connection. Specifically, the final M2M centers. IOT has a compelling job for executives in interested urban areas. Nowadays, many strategies such as remote sensor regularization, radio recursion, and computerized image manipulation based intensive traffic architecture provide executives with transportation. Are used to control traffic most effectively. In 2012, JPS announced its decision to provide identifying data with parking space. It has an excellent interface, although it is not a reservation highlight [10]. MR. Patil genuinely stopped WSN and RFID in 2013 [11]. In this framework, the inter-integrated circuit assembly can guide the driver to find a way to stop by using RFID and WSN. This framework is also time consuming, with significant drawbacks. H. Singh provided the robotic stop structure with the help of Bluetooth. In this framework, Bluetooth is used for correspondence or organization. This framework depends on the rack and pinion system for straight movement. So the basic disadvantage of this framework is that the entire stop is built into the rack, and what's more, the pinion tool is more expensive and neater. Zhang [13] devised an effective decentralized method to reduce fuel consumption whenever the campaign was or was halted. This calculation provides an answer to the blockage constraint and reduces travel time. S. Huang [14] built-in coordination control in a reservation-based framework to exploit a unique network that delivers energy to related transports. C. Fortella [15] speaks of a programmed completely computerized vehicle, which has significant differences these days. This paper additionally depicts the progress of booking calculation. K.Zang [16] proposed an enriched scheduling calculation where the reservation is located. This guarantees a higher request to be answered according to the inclination. This calculation is reproduced in high demand vehicles. Q. Ashokumar [17] addresses the multi-layered vehicle information cloud condition confirmed by IOT innovations and distributed computing. In this paper, an interesting PC code is proposed which can talk to different gadgets across the street. At this innovative time, ambiguous light letters are used in addition to the vehicle letter to the vehicle [18 Elias Is. According to Tracos, [19] the IOT is used as a current traffic screen to reduce general traffic from the Midtown region. [20] This paper relies on modified administrations for correspondence transfer with the help of Wi-Fi, WI-Max, Zig-Pee, Satellite Communication and more. For example, with this sensor we no doubt connect to the wellbeing and traffic space, we can measure all of a driver's well-being parameters while driving, such as heart rate, pulse, and so on, and provide the driver with a consistent level of well-being. This creates a more secure position. Basavaraju [21] implements a basic interest vehicle exit structure, which

reduces carbon dioxide and facilitates this structure. The creator uses a wide-point camera as a sensor that records or detects free space, and these records are used as a formal room for interested parking [22].

#### 4 CONCLUSION:

Overall, this study examines a variety of strategies or practices. This survey provides data on traffic for executives or interested parking strategies used for smart cities. The widespread accessibility of sensors or remote gadgets has made the architecture increasingly reliable or modifiable and enhances the successful progression of IOT-based application. The IOT provides the greatest response to traffic control and gives the vehicle the best possible results. This paper looks at every different technique for smart traffic management under the idea of Smart City.

#### 6 REFERENCES:

- [1] Khaoula Hassoune, Waffa Dachry, Fouad Moutaouakkil And Hicham Medromi "Smart parking system : A Survey" in IEEE 2016.
- [2] Kshama Raichura and Nilesh Padhariya "Event-based dynamic Parking Allocation System in Vehicular Networks (edPAS)" in IEEE 2014.
- [3] Walter Balzano And Fabio Vitale "DiG-Park: a smart parking availability searching method using V2V/V2I and DGP-class problem" in IEEE 2017.
- [4] Tohid Shekari, Amin Gholami, Farrokh Aminifar "Optimal Parking Lot Placement Considering Operational and Security limitations Using COA" in IEEE 2014.
- [5] Javier Arellano-Verdejo And Enrique Alba "Optimal Allocation of Public Parking Slots Using Evolutionary Algorithms" in IEEE 2016.
- [6] Xuejian Zhao, Kui Zhao, And Feng Hai "An Algorithm of parking planning for smart parking system" in IEEE 2014.
- [7] Dharmesh Kashyap And Jaydeep Viradiya "A survey of various Load Balancing Algorithms in cloud computing" in IJSTR 2014.
- [8] Thanh Nam Pham, Ming-Fong Tsai, Duc Binh Nguyen,Chyi-Ren Dow, And Der-Jiunn Deng "A Cloud-Based Smart-Parking System Based on Internet-of-Things Technologies" in 2015.
- [9] Luca Baroffio, Luca Bondi, Matteo Cesana, Alessandro Enrico Redondi, Marco Tagliasacchi "A Visual Sensor Network for Parking Lot Occupancy Detection in Smart Cities" in 2015.
- [10] Yang Jihoon Jorge Portilla Teresa Riesgo, "Smart parking service based on wireless sensors Network," IEEE, 2012.
- [11] ManjushaPatil Vasant N. Bhonge, "Wireless Sensor Network and RFID for Smart Parking System," Int. J. Emerg. Technol. Adv. Eng. Website www.ijetae.com, vol. 3, no. 4, 2013.
- [12] Harmeet Singh ChetanAnand Vinay Kumar Ankit Sharma, "Automated Parking System With Bluetooth Access," Int. J. Eng. Comput. Sci. ISSN2319-7242, vol. 3, no. 5, pp. 5773-5775.
- [13] Y. J. Zhang or A. A. Malikopoulos and C. G. Cassandras, "Optimal control and coordination of connected and automated vehicles at urban traffic

- intersections,” in Proc. Amer. Control Conference [online], 2016.
- [14] S. Huang or A. W. Sadek and Y. Zhao, “Assessing the mobility and environmental benefits of reservation-based intelligent intersections using an integrated simulator,” IEEE Trans. Intell. Transp. Syst., vol. 13, 2012.
- [15] A. d. La Fortelle, “Analysis of reservation algorithms for cooperative planning at intersections,” in Proceeding. 13th International IEEE Conference Intelligent Transport System, 2010.
- [16] K. Zhang A. de La Fortelle D. Zhang and X. Wu, “Analysis and modeled design of one state-driven autonomous passing-through algorithm for driverless vehicles at intersections,” in Proc. IEEE 16th Int. Conf. Comput.Sci. Eng, 2013.
- [17] K. Ashokkumar, “Cloud Based Intelligent Transport System,” Sci. Direct, vol. 50, pp. 58–63, 2015.
- [18] L. U. Khan, “Visible light communication: Application, architecture, standardization, and research challenges,” Digit. Commun. Networks, Elsevier, pp. 1–10, 2016.
- [19] E. Z.Tragos, “Enabling Reliable and Secure IOT-based Smart City Application,” IEEE, pp. 111–116, 2014.
- [20] G. Aditya, S. Bryan, P. Gerard, and M. Sally, “Smart City Architecture and its Application based on IOT,” Sci. Direct., Elsevier, vol. 52, pp. 1089–1094, 2015.
- [21] S. R. Basavaraju, “Automatic Smart Parking System using Internet of Things(IOT),” Int. J. Sci. Res. Publ., vol. 5, no. 12, pp. 629–632, 2015.
- [22] R. M.M, A.Musa, AtaurRahman, N.Farahana, and A.Farahana, “Automatic Parking Management System and Parking fee collection based on number plate recognition,” Int. Mach. Learn. Comput., vol. 2, 2012.