

Paper Type: Original Article



Status Monitoring of Parking Space by Using Sensor Technology

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Citation:



Hao, Zh. (2022). Status monitoring of parking space by using sensor technology. *Big data and computing visions*, 2(3), 133-137.

Received: 13/02/2022

Reviewed: 03/04/2022

Revised: 28/04/2022

Accept: 07/06/2022

Abstract

Parking a vehicle in a busy parking lot lead to excess time of driving in search of free space which lead to waste of time and environmental pollution. Lack of proper information to vacant parking spaces is one of the main reasons for insufficient parking. Smart parking system and technologies facilitate guidance of drivers to free parking spaces thereby improving parking efficiency. So with the help of these advanced features we can monitor the status of every parking space. As society fosters the streets become more swarmed and vehicles fill in number there are different kind of circumstances on streets in view of weather patterns and gridlocks because of mishaps or vehicles breakdowns and because of every one of these arriving at objective causes to feel like drained and bothered.

Keywords: Parking, sensor, Internet of things.

1 | Introduction

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The parking system faces several issues in the parking atmosphere. In order, to resolve those problems, smart parking system has been developed and being employed in many places [1]. Numerous approaches and researches are created to overcome the difficulties of parking. As a result, several systems and technologies are developed for parking. The technologies of the parking system uses Wireless Sensor Network (WSN) for identification and communication process [2]. The car parking system is currently a smart system by using numerous technologies and advanced researches [3]. The smart parking system is being implemented in many environments with various features, which solve their problems faced in their day to day life, and these systems advantage the rich [4].

These advanced techniques in traffic system helps in safety and many more ways which leads to decrease in time that we waste in traffic and helps to find a better route than usual which can lead to save fuel and wastage of time in blocked roads [5]. This also lead to save environment which is polluted with gases that are released into environment while dialing the car in the traffic and also saves fuel which also reduces wastage and consuming of fuel so with the help of these advanced systems in transportation we can see the road where it is clear and where it is blocked and we can



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<https://doi.org/10.22105/bdcv.2022.332451.1059>

avoid that route [6]. If there is a crash in middle of the way we are travelling we can get an alert message so that we can know the status and plan accordingly this also helps to send an emergency alert to police and emergency so that they can reach the spot in advance and clear the place [7].

2 | Literature Review

2.1 | Smart Parking System

Smart parking system is a new technique that we can see the empty parking spaces in our mobile which work based on sensors, sensors are placed in each parking slot if the vehicle is parked in that slot the info of the parking slot or status of the slot is updated in the mobile app as it is occupied so the driver or user can find the vacant slot in the parking slot so that it is very easy to them to find a free or empty slot in the parking lot [8].

By applying this system, we can uncover the pressure, and time for the driver when he is searching for a stopping. It decreases the traffic as driver definitely knows the stopping availabilities [9]. By brilliant stopping innovation drivers can make instalments by utilizing electronic instalments through an application or programs, which makes stopping experience more straightforward and gives organized information to revenue sources [10].

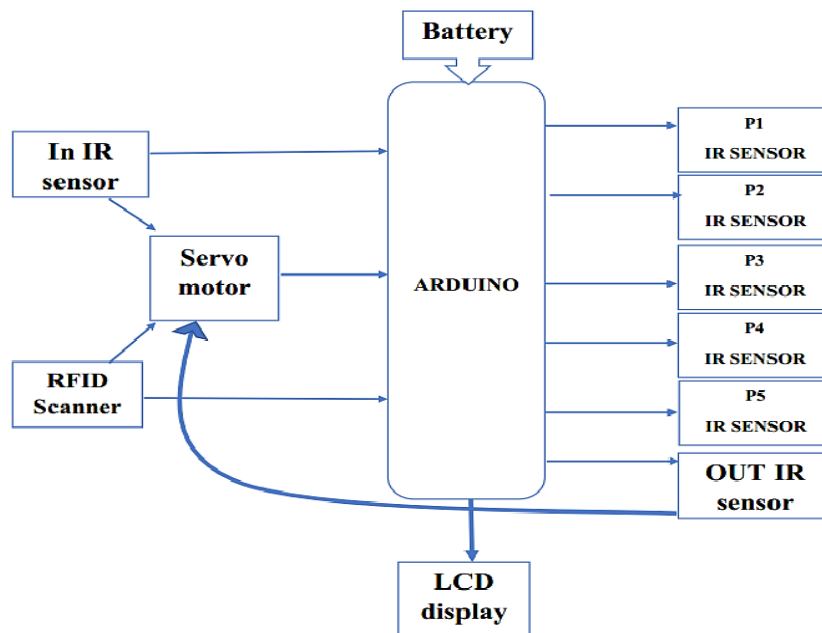


Fig. 1. Block diagram of smart parking system.

2.2 | Role of Sensors in Transportation

Keen traffic framework is a traffic framework which consolidates many vehicle frameworks and traffic offices with high innovation and data to expand the productivity and wellbeing of the street and afterward to work and oversee it logically [11]. The sensors in transportation helps the drivers in many ways the sensors detect if there is any block in the road or any crash happened if the road blocks it shows an alert in the users mobile and help them to avoid the way they are using and use an alternate route this helps drivers to reduce wastage of time and fuel and also helps emergency services to reach the spot in emergency [12].

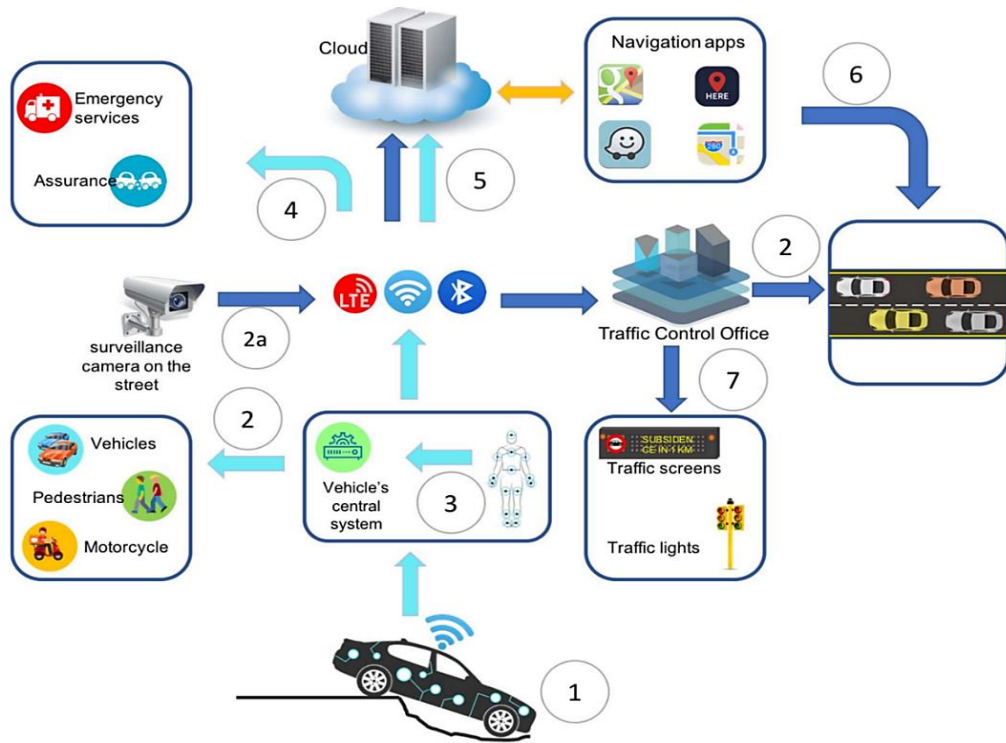


Fig. 2. Role of sensors in transportation.

3 | Proposed Work

3.1 | Advantages of Smart Parking System

The smart parking system has been developed to provide easy parking slots in parking area. Because of this system many problems can be get solved. Customers can reduce wastage of time and fuel with this system [13]. We can also reduce the issue of traffic and get allocated with the respective parking slots which are a safe and secure system [14]. Which is also a key to reduce traffic and pollution? environment – with the help of smart parking system we can reduce the time taken to find an empty parking slot that is we are reducing the drive time also which helps to reduce the consumption of fuel which directly reduces the emission of greenhouse gases [15].

Convenience. It can be frustrating in peak times to find an empty parking slot. So smart parking system came with easy reservation of empty parking slots which helps in quickly finding and reserving the parking slots [16].

Reduced traffic. When a driver knows exactly where he needs to park one can reduce dialing and excessive driving which helps in unnecessary traffic [17], [18].

Increase in safety. Parking lot security contain real-time data and prevent improper parking and suspicious activities in parking lot. And also reduces spot searching on streets which reduce accidents by distraction of searching for parking [19], [20].

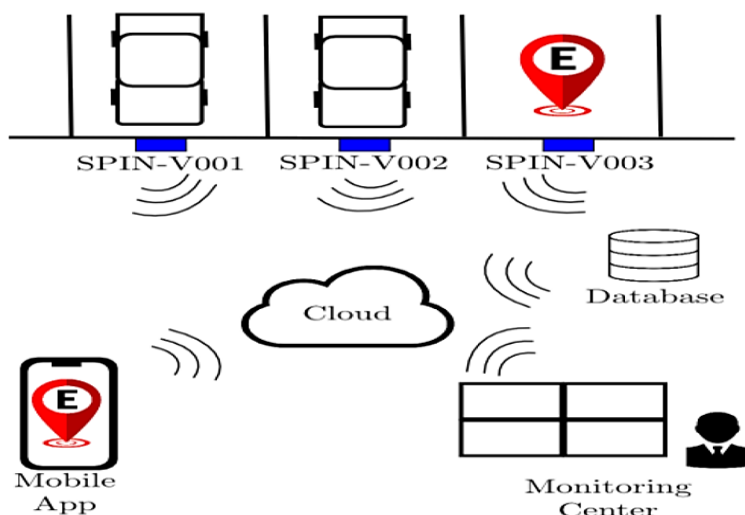


Fig. 3. Working of smart parking system.

3.2 | Working of Smart Parking System

Smart parking systems use advanced sensing devices such as cameras, vehicle counting equipment, sensors installed in pavements, to determine the vacancy of parking slots. More advanced devices are being used to analyze and transmit data to a base in real-time [21]-[22]. Each and every vehicle that enters a parking lot is recognized by the sensors and the data is sent to the cloud, and then the information is classified and made available to the users about the status of the slot whether the slot is empty, reserved, or occupied so that the user or driver can get a clear idea and he can also reserve a parking slot [23]. Here, sensors and cameras will play a major role in a smart parking system as each and every data is collected by the sensors and the collected data is sent to the cloud. The experts in the monitoring center classify the data received from the sensors and they will update the information in the app, which is displayed to the users [18].

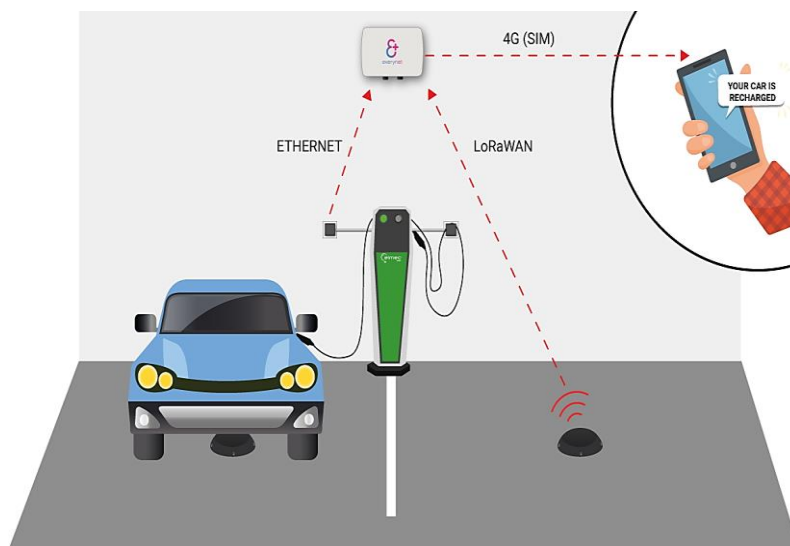


Fig. 4. Smart parking system.

4 | Conclusion

A smart parking system is designed to help drivers find an empty parking slot easily, which helps them save time and fuel. It can be easily accessible by users through a mobile app. With the help of sensors in transportation, we can reduce the wastage of time in traffic in blocked roads and help drivers take another route.

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