



# Autonomous and Connected Heavy Vehicle Technology

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## Chapter 7 - A secured IoT parking system based on smart sensor communication with two-step user verification

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### Abstract

Internet of Things (IoT)-enabled smart applications, which are considered essential in today's computerized world, are improving the quality of life in both urban and rural environments through their efficient services. Cloud-based IoT can communicate with a physical object having various sensors (including IR, accelerometer, and ultrasonic sensors) to access required information. Automobile manufacturers, who explore the features of vehicles and implement them in a way that is useful to their customers, are increasingly interested in IoT applications, as they help to deliver more sophisticated and useful products. Therefore the number of vehicle users is constantly increasing day by day.

Traffic congestion is usually caused by two main reasons: (1) increased use of vehicles and (2) lack of proper parking in congested areas. IoT devices are now being used in many real-time applications, such as medical care, agriculture, as well as transportation and other industrial uses, and the emerging technology of the IoT can also offer solutions to many congestion problems, using the Arduino microcontroller and sensors.

In some cases, if a vehicle is not parked properly in the parking lot, traffic may be congested due to incorrect information provided by the system. Typically, in a smart system, IoT sensors and radio frequency identification (RFID) are trusted to monitor traffic in a parking area and are also used to check whether a vehicle is in a particular slot. The most important function of RFID tags is to read the information when the vehicle enters the parking area; data storage and update can then be handled automatically at the exit, allocating new space for other vehicles looking for a spot, as requested.

Of course, the IoT offers many benefits to improve quality of life. However, smart vehicles make use of much confidential and restricted information to operate their smart system. Due to the smart structure, this data can be easily monitored by third parties. Therefore this chapter addresses three key issues related to automated parking systems, namely: (a) detecting parking availability; (b) traffic reduction; and (c) data security management. To overcome the problems and mitigate the security issue, we have proposed a secure parking detection algorithm called *e-VirtualParking* to search for a smart parking slot using RFID and Arduino. Furthermore, this chapter also discusses the role of WSN and cryptography in tackling the security issue of secure data management.

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## References (0)

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### Cited by (2)

#### [Shine: A deep learning-based accessible parking management system](#)

2024, Expert Systems with Applications

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#### [Review on environmental aspects in smart city concept: Water, waste, air pollution and transportation smart applications using IoT techniques](#)

2023, Sustainable Cities and Society

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