Chapter 8

A Fusion of VANETs and IoT for Intelligent and Secure Communication

Ashwani Kant Shukla
Babasaheb Bhimrao Ambedkar University, India

Vivek Shukla
Babasaheb Bhimrao Ambedkar University, India

Raj Shree
Babasaheb Bhimrao Ambedkar University, India

Ravi Prakash Pandey
Dr. Rammanohar Lohia Avadh University, India

Dhirendra Pandey
Babasaheb Bhimrao Ambedkar University, India

ABSTRACT

The modern smart cities completely rely on the technology where the smart and intelligent-based transportation management system is a primary requirement and that can only be achieved by the advancement in traditional vehicular ad-hoc network (VANET). The primary two techniques such as IoT and security mechanism are incorporated with the VANET system which helps to design the robust framework. Due to quick transformation in technological landscape, the threats and attacks also get advanced. The most prominent characteristics of the VANET is to provide the self-aware system which assists for the better management in the transportation system. As per the advancement in the attacks, the robust defense mechanism should also be increased. If not, there would be the huge loss in terms of the lives of living beings, societal, and economic. Therefore, this study is completely based on the analysis and recommendation for developing the robust IOV system, which ensures the secure infrastructure.

INTRODUCTION

Vehicular Ad hoc network (VANET) deals with the network which is designed using ad-hoc system. For sharing the significant information from one device to another device the moving vehicles and devices have to connect in the common platform over secure wireless network. With vehicles and other equipment created a small network at the same time behaves as nodes in the network whereas if one node keep any of the information it shares to all connected nodes. These processes of sharing the information within the network it continues. In addition, the data received by nodes from different sources serves to refine the information and share it with other connected devices (M. Feiri et. al, 2013). The concept of the sharing and communicating among the connected nodes is based on open network such as the nodes are free to connect and leave the network anytime. Nowadays, the newly developed smart and intelligent based vehicle see running on road is basically equipped with on board sensors which makes quite effortless to connect and integrates the network using the characteristics of the VANET. It is suppose to develop different types of wireless technologies such as dedicated short range communications and others are cellular and satellite based wireless technologies. Also, ad-hoc networks of vehicles can be accounted as a parameter of intelligent transportation frameworks (A. Tolba et. al, 2019). Due to the characteristics of the VANET, the moving vehicles are connecting and sharing information in specific secure infrastructures. For example, when one vehicle directly connecting and sharing information to another vehicle is known as Vehicle to Vehicle (V2V) and with the help of the Road Side Unit (RSU) when vehicle directly connecting and sharing information to infrastructure is called Vehicle-to-Infrastructure (V2I) (Z. Zhou et. al, 2017).

The Internet of Things (IoT) deals with the sensor embedded hardware and other digital devices interfaces with API for sharing the information among the nodes using internet. When the implementation of the framework in such way that where vehicles are connected to internet and functions like ad-hoc network is called Internet of Vehicles (IoV). In the greatest transformation of the technological landscape in the wireless and mobile communications industries the characteristics of the IoT play quite significant role for designing and developing the smart vehicle (Z. Ning et. al, 2017). Also, the VANET enables the different types of facilities to the IoV which is able to easily deal with road transport odds entities. For better traffic flow control and secure transmission of information regarding cities-based technologies the systematic solution can be achieved with IoV.

Due to IoT, the smartness and intelligences has increased very fast and drawn the attention of the various industries to adapt such technology where as IoV network is one of them. For the automobile industries, the IoV is very emerging field, for better traffic flow control and secure transmission of information, because the IoT make

13 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/a-fusion-of-vanets-and-iot-for-intelligent-and-secure-communication/313227

Related Content

Social Cybersecurity and Human Behavior

S. Raschid Mullerand Darrell Norman Burrell (2022). *International Journal of Hyperconnectivity and the Internet of Things (pp. 1-13).*
www.irma-international.org/article/social-cybersecurity-and-human-behavior/305228

The Effect of the Use of Social Media on Organizational Commitment

Pavithra Salanke, Osibanjo A. Omotayoand Deepak K. V. (2022). *International Journal of Hyperconnectivity and the Internet of Things (pp. 1-13).*
www.irma-international.org/article/the-effect-of-the-use-of-social-media-on-organizational-commitment/294896

Scalability of Pervasive Communication Networks in IoT

Manal Khayyatand Nadine Akkari (2022). *International Journal of Hyperconnectivity and the Internet of Things (pp. 1-11).*
www.irma-international.org/article/scalability-of-pervasive-communication-networks-in-iot/294895

Workflow Validation Framework in Collaborative Engineering Environments

Wikan Danar Sunindyo, Thomas Moser, Dietmar Winkler, Richard Mordinyiand Stefan Biffl (2013). *Distributed Computing Innovations for Business, Engineering, and Science (pp. 285-299).*
www.irma-international.org/chapter/workflow-validation-framework-collaborative-engineering/72050

Understanding Image Classification Using TensorFlow Deep Learning - Convolution Neural Network

Vinit Kumar Gunjan, Rashmi Pathakand Omveer Singh (2019). *International Journal of Hyperconnectivity and the Internet of Things (pp. 19-37).*
www.irma-international.org/article/understanding-image-classification-using-tensorflow-deep-learning---convolution-neural-network/241803