## Chapter 5 A Review of Various Modeling Software for VANETs: Simulation and Emulation Tools

**Divya L.** Pondicherry Engineering College, India

Pradeep Kumar T. S. https://orcid.org/0000-0001-7071-4752 Vellore Institute of Technology, Chennai, India

## ABSTRACT

There is great demand for VANETs in recent times. VANETs enable vehicular communication with the advent of latest trends in communication like 5G technology, software-defined networks, and fog and edge computing. Novel applications are evolving in recent times on VANETs with the proliferation of internet of things. Real test bed implementation is not always feasible with various limitations like expenditure and manpower and requires more time to experiment with the new facets of VANETs. Hence, the researchers should be aware of the variety of simulation tools that are capable of running VANET simulations. Simulation is a powerful tool in developing any critical/complex system that constitutes minimum cost and effort. The simulation tools of VANETs should support multiple mobility models, real-world communication protocols, and traffic modeling scenarios. This chapter gives a clear view on available tools and their characteristics on VANETs for research purposes.

DOI: 10.4018/978-1-6684-3610-3.ch005

Copyright © 2023, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

#### INTRODUCTION

The vehicular mobility in VANETs relies on micro and macro mobility. Communication protocols support interchanging data between vehicles and RSUs.

VANETs simulation is possible in all layers of Open System Interconnection (OSI) reference model. Agarwal et al., developed a TraceReplay simulator at application layer to implement realistic implementation of applications in NS3. TraceReplay works from the network trace information to generate real world applications in NS3. Any application layer protocols like Hyper Text Transfer Protocol (HTTP) can be replayed with this TraceReplay proposed by Agrawal (2016). Jang (2017) proposed overlay platform at application layer with Greedy Perimeter Stateless Routing (GPSR) and Ad-hoc On-demand Distance Vector (AODV) protocols to increase reliability in VANET communication. Monir (2022) proposed seamless Mobile Edge Computing (MEC) based SDN handover management scheme for VANETs for handling the mobility challenges in VANETs. MEC server at Road Side Unit (RSU) runs the handover logic upon the intersection of adjacent RSU's. The handover is done when RSSI values falls below the defined threshold. The limitation of the proposed scheme is it is unable to handle cross roads handover. Summarized list of existing works is given in Table 1.

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: <u>www.igi-</u> <u>global.com/chapter/a-review-of-various-modeling-software-</u> for-vanets/313224

## **Related Content**

#### Peer-to-Peer Video Streaming

Jânio M. Monteiro, Rui S. Cruz, Charalampos Z. Patrikakis, Nikolaos C. Papaoulakis, Carlos Tavares Calafateand Mário S. Nunes (2013). *Multimedia Networking and Coding (pp. 254-313).* 

www.irma-international.org/chapter/peer-peer-video-streaming/73142

# Internet of Things and Big Data-Driven Data Analysis Services for Third Parties: Business Models, New Ventures, and Potential Horizons

Izabella V. Lokshina, Barbara J. Durkinand Cees J. M. Lanting (2019). *Strategic Innovations and Interdisciplinary Perspectives in Telecommunications and Networking (pp. 256-289).* 

www.irma-international.org/chapter/internet-of-things-and-big-data-driven-data-analysisservices-for-third-parties/221957

## A Flexible and Centralized Approach for Access Control in Heterogeneous IoT Environment

Jean-Noël Colinand Laurent Evrard (2019). *International Journal of Hyperconnectivity* and the Internet of Things (pp. 22-42).

www.irma-international.org/article/a-flexible-and-centralized-approach-for-access-control-inheterogeneous-iot-environment/234343

#### 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

#### Mitigating the Blended Threat: Protecting Data and Educating Users

Christophe Veltsos (2011). *Network Security, Administration and Management: Advancing Technology and Practice (pp. 20-37).* www.irma-international.org/chapter/mitigating-blended-threat/54198