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Review of IDS & IPS in VANET (Vehicular Ad-hoc Networks)

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ABSTRACT

Significant data collection has revolutionized our daily lives and brought about changes in various industries such as marketing, telecommunications, finance, and transportation systems. With the help of technological advancements, data collection plays a momentous role in transportation systems, particularly with regard to traffic flow signals, traffic control, and vehicular environment/networks. However, security is a major concern in this field as many aspects of these processes are sensitive and pose a huge risk of being attacked, leading to great consequences. Due to this, it is imperative to focus on the vulnerabilities that exist in Vehicular Ad-Hoc Networks (VANET) in terms of intrusion detection and prevention systems. Wireless Sensor Networks (WSNs) have also been applied in Intelligent Transportation Systems (ITSs) to address these issues. Over the last decade, this topic has received extensive research compared to that of the wired network infrastructure VANET and UAV communications against various cyber-attacks that deteriorate the integrity, confidentiality, and availability of vehicular data. Therefore, this paper aims to systematically review the related work on machine learning techniques for intrusion detection and prevention systems in VANET, UAV, and Wireless Sensor Networks.

Key words:

ML Machine Learning, DL Deep Learning, AI Artificial intelligence, RL Reinforcement Learning, ITSs Intelligent Transportation Systems, VANET vehicular ad-hoc network, UAV unmanned aerial vehicle, DNNs Deep Neural Networks, IOV Internet of Vehicles, NN Neural Networks, CNNs Conventional Neural Networks, RNNs Recurrent Neural Networks, DDPG Deep Deterministic Policy Gradient, IDS Intrusion Detection System, IPS Intrusion Prevention System.

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