

A Decision-Based Ensemble Framework for Intrusion Detection in The Internet of Vehicles.

Modern vehicles, including autonomous and connected cars, have integrated many functions through connections and communication with other vehicles, smart devices, and infrastructure. However, the growing Internet of Vehicles (IoV) connectivity has also increased the risk of network attacks. To defend IoV systems against cyber threats, intrusion detection systems (IDS) have been developed using machine learning (ML) techniques. To accurately detect different attacks in IoV networks, we introduce a new ensemble IDS framework called Leader Class and Confidence Decision Ensemble (LCCDE). The framework determines the best ML model for each attack class among XGBoost, LightGBM, and CatBoost. It then uses the leading class models and their predictive certainty to make accurate intruder detection decisions. Experiments with two public IoV security datasets demonstrate the effectiveness of the proposed LCCDE in detecting cyberattacks on both internal and external networks.