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attack detection using deep learning

Abstract

In light of the increasing prevalence and sophistication of cyber threats, particularly Distributed Denial-of-Service (DDoS) attacks, effective detection methods are imperative. This study introduces a novel approach leveraging deep learning, specifically a contractive autoencoder, for anomaly detection. By training the model on normal traffic patterns and utilizing a stochastic threshold technique, we detect anomalies indicative of attacks. Evaluation on established datasets—CIC-IDS2017, NSL-KDD, and CICDDoS2019—demonstrates the efficacy of our method. Results reveal successful intrusion detection, with accuracies ranging from 93.41% to 97.58% on the CIC-DDoS2019 dataset, and achieving 96.08% and 92.45% accuracies on NSL-KDD and CIC-IDS2017 datasets, respectively.