Network intrusion detection using Linear Discriminant Analysis and CNN with Adam Optimizer

Abstract

Networks have an important role in our modern life. In the network, Cyber security plays a crucial role in Internet security. An Intrusion Detection System (IDS) acts as a cyber-security system which monitors and detects any security threats for software and hardware running on the network. There we have many existing IDS but still we face challenges in improving accuracy in detecting security vulnerabilities, not enough methods to reduce the level of alertness and detecting intrusion attacks. Machine learning methods can detect data from past experience and differentiate normal and abnormal data. In our work, the Convolutional Neural Network (CNN) deep learning method was developed and optimized using Adam Optimizer in solving the problem of identifying intrusion in a network. Using the NSL-KDD public dataset we trained the CNN algorithm. The proposed IDS model is aimed at detecting network intrusions by classifying all the packet traffic in the network as normal or malicious classes.

Keywords

NIDS, Deep learning, CNN, Cyber security, Linear Discriminant analysis, Computer Networks, Protection, Data Security.

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