

Network Intrusion Detection Using Machine Learning Techniques

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Abstract: *In this work, I compare the utilization of assorted machine learning techniques for detecting intrusions in networks. The dataset that we used is NSL-KDD dataset, this dataset may be a refined version of KDD'99 dataset. Firstly, I analyze the dataset, to spot the quantity of examples and features that are present in it, to spot the amount of categorical features versus continuous features. Secondly, I perform preprocessing on the dataset, as a part of preprocessing step, I perform feature selection, followed by feature encoding, followed by feature scaling. I used Extra Trees Classifier feature selection technique, to extract those features which contribute the foremost. I used One Hot Encoder feature encoding technique, to encode the categorical features. I used Standard Scaler feature scaling technique, to scale the numerical features, so all the numerical features are within the same range. Thirdly, I apply various machine learning techniques like Decision Tree, Random Forest Classifier, Gaussian Naïve Bayes and KNN on this preprocessed dataset for training the models to classify normal and attack network traffic. Then i exploit these trained models on a test dataset, to perform classification of normal and attack network traffic. so we compare the accuracy achieved by each of those machine learning models, to spot the simplest machine learning model. Finally, compared the test accuracy achieved by the simplest machine learning model that's identified in previous step, and that we propose that, KNN classifier gives better accuracy for network intrusion detection.*

Keywords: Machine Learning, Network Intrusion, Intrusion Detection and Features.

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