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Increasing The Performance of Machine Learning-Based Models on an Imbalanced and Up-To-Date Dataset

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Abstract: In growing times, the use of internet is spreading at a lightning speed and which as a result N/Wed computer has been increasing in our daily lives. This expanding chain of N/Wed computer weakens the servers which enable hackers to intrude on computer by using various means which may be know as well as unknown and makes them even harder to detect. So as a protection to the computers the Intrusion Detection System (MODEL) is introduced which is trained with some MACHINE LEARNING techniques by making use of previous available data. . The used datasets were collected during a limited period in some specific N/W and generally don't contain up-to-date data. In this paper, we propose six machine-learning-based MODELs by using Random Forest, Gradient Boosting, Ada boost, Decision Tree, and Linear Discriminant Analysis algorithm. To implement a more realistic MODEL, an up-to-date security dataset, CSE-CIC-MODEL2018, is used instead of older and mostly worked datasets. Therefore, to increase the efficiency of the system depending on attack types and to decrease missed intrusions and false alarms, the imbalance ratio is reduced by using a synthetic data generation model called Synthetic Minority Oversampling Technique. Experimental results demonstrated that the proposed approach considerably increases the detection rate for rarely encountered intrusions.

Keywords: Model, Intrision Detection, Smote, Machine Learning, Cse-Cic- Model 2018, Im Balanced Dataset

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