

Network Intrusion Detection by Machine Learning Techniques

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Abstract: The web has been utilized broadly in all parts of life. The Interference of web associations can create a huge effect. Hence, the job of the Network Intrusion Detection System (IDS) to distinguish digital attacks is vital. A suspicious connection needs to be blocked immediately before performing anything further. The Higher the data transmissions occurring daily its being important to protect the data and its been main factor to prevent intrusions. A good Intrusion System is to be developed to prevent Attacks. This paper presents a novel approach to classify intrusion attacks. The focal thought is to apply different machine learning algorithms like SVM, Naive Bayes, Neural Networks, Random Forest, Logistic Regression. We apply these kinds of supervised and unsupervised learning Techniques and classify the attack classes. The presentation of the various models was analyzed utilizing every one of the highlights and the best-chosen highlights were executed utilizing the disarray grids.

Keywords: Feature Extraction, Deep learning, ML, Transfer Learning, KDD, Train Set, Test Set

REFERENCES

- [1]. H. Wang, J.Gu, and S.Wang, "An effective intrusion detection framework based on SVM with feature augmentation," Knowl.-Based Syst., vol. 136, pp. 130–139, Nov. 2021.
- [2]. Setareh Roshan, Yoan Miche, Anton Akusok, Amaury Lendasse; "Adaptive and Online Network Intrusion Detection System using Clustering and Extreme Learning Machines", ELSEVIER, Journal of the Franklin Institute, Volume.355, Issue 4, March 2018, pp.1752-1779.
- [3]. Reda M.Elbasiony, "A hybrid NIDS framework based on RF and weighted k means", ali shams engineering journal, pp 753- 762(2020)
- [4]. Hesham Alwajiry, "Bayesian based IDS", CIS, Journal of king saud university, pp1-6,(2020)
- [5]. Mukkamala, "Intrusion detection using NN and SVM", IJCNN2002, Vol 2, IEEE(2021)
- [6]. Lee Hansung, "IDS based on multi class SVM" Rough sets, data mining, and granular computing, Springer, pp 511-519
- [7]. G V Nadiammai, "Effective approach toward IDS using data mining techniques", Egyptian informatics journal, pp37-50
- [8]. Dheeraj pal, "Improved genetic algorithm for IDS", In. sixth international conference on CCICN2014, PP835-839
- [9]. Wathiq Laftah Al-Yaseen, Zulaiha Ali Othman, Mohd Zakree Ahmad Nazri; "Multi-Level Hybrid Support Vector Machine and Extreme Learning Machine Based on Modified K-means for Intrusion Detection System", ELSEVIER, Expert System with Applications, Volume.66, Jan 2020, pp.296-303.
- [10]. Iftikhar Ahmad, Mohammad Basher, Muhammad Javed Iqbal, Aneel Raheem; "Performance Comparison of Support Vector Machine, Random Forest, and Extreme Learning Machine for Intrusion Detection", IEEE ACCESS, Survivability Strategies for Emerging Wireless Networks, Volume.6, May 2020, pp.33789-33795.
- [11]. BuseGulAtli1, Yoan Miche, Aapo Kalliola, Ian Oliver, Silke Holtmanns, Amaury Lendasse; "Anomaly-Based Intrusion Detection Using Extreme Learning Machine and Aggregation of Network Traffic Statistics in Probability Space" SPRINGER, Cognitive Computation, June 2020, pp.1-16
- [12]. Pinjia He, Jieming Zhu, Shilin He, Jian Li, and Michael R. Lyu; "A Feature Reduced Intrusion Detection System Using ANN Classifier", ELSEVIER, Expert Systems with Applications, Vol.88, December 2021 pp.249-247

- [13]. Vajiheh Hajisalem, Shahram Babaie; "A hybrid intrusion detection system based on ABC-AFS algorithm for misuse and anomaly detection", ELSEVIER, Department of Computer Engineering, Vol. 136, pp. 37-50, May 2021.
- [14]. R. G. Bace, "Intrusion Detection", Macmillan Technical Publishing. 2021
- [15]. Freund, Y mason L, "The alternating Decision tree learning algorithm", In proc of 6th ICM Bled, Slovenia, pp 124-133
- [16]. M. A. Jabbar, " Alternating decision trees for early diagnosis of heart disease", Proceedings of International Conference on Circuits, Communication, Control and Computing ,pp 322-328
- [17]. L. Dhanabal and D. S. P. Shantharajah, "A Study On NSL-KDD Dataset For Intrusion Detection System Based On Classification Algorithms," Int. J. Adv. Res. Comput. Commun. Eng., vol. 4, no. 6, pp. 446-452.