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Detection Model for Ambiguous Intrusion using SMOTE and LSTM for Network Security
(2024) *Journal of Advanced Research in Applied Sciences and Engineering Technology*, 39 (2), pp. 191-203.

DOI: 10.37934/araset.39.2.191203

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Abstract

In today's interconnected world, networks play a crucial role. Consequently, network security has become increasingly vital. To ensure network security, various methods are employed, including digital signatures, firewalls, and intrusion detection. Among these methods, intrusion detection systems have gained significant popularity due to their ability to identify new attacks. However, the accuracy of these systems still requires further improvement. One of the challenges is the potential bias introduced by using imbalance datasets that contains more information on normal activities than on attacks. To address it, SMOTE method was proposed and additionally, the study explores the use of Long Short-Term Memory (LSTM) for classification purposes. The experiments are conducted using two datasets: UNSW NB-15 and CICIDS 2017. The results obtained demonstrate that the proposed methods achieve an accuracy of 96% with the UNSW NB-15 dataset and 99% with the CICIDS 2017 dataset. These findings indicate an improvement of 3% and 1% respectively compared to existing literature. © 2024, Semarak Ilmu Publishing. All rights reserved.

Author Keywords

imbalance dataset; Intrusion detection; LSTM; SMOTE

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Publisher: Semarak Ilmu Publishing

ISSN: 24621943

Language of Original Document: English

Abbreviated Source Title: J. Adv. Res. Appl. Sci. Eng. Technol.
2-s2.0-85185504091

Document Type: Article

Publication Stage: Final

Source: Scopus

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