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# INTRUSION DETECTION MODEL USING CNN-LSTM ON APACHE SPARK PLATFORM



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## Abstract:

The rapid spread of cloud computing and big data has led to numerous security breaches. Intrusion Detection Systems (IDSs) are an important security consideration for companies and organizations to protect their data from attacks. However, traditional IDSs struggle to adapt to the complex, changing cloud computing environment and data. This paper proposed the Spark-CNN-LSTM model, which used Deep Learning (DL) algorithms to enhance Intrusion Detection (ID) and the Spark big data platform to process data in real time. The proposed model used the Spark platform to load quickly and process data. In addition, the model used Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTMs) to detect and predict intrusions in real time. Furthermore, the model used the Synthetic Minority Oversampling Technique (SMOTE) to address data imbalance. In this model, the UNSW NB 15 and NLS-KDD datasets were used for evaluation. The results showed higher accuracy in detecting intrusions than existing methods. The model achieved 99.9% and 99.7% accuracy, respectively, indicating its effectiveness in a cloud environment.

**Keywords:** Intrusion Detection (ID), Convolutional Neural Networks (CNN), Long Short-Term Memory (LSTM), Spark, Synthetic Minority Oversampling Technique (SMOTE).

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