

E-Commerce Transaction Fraud Detection Using Machine Learning Technique

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Abstract

The swift expansion of e-commerce has resulted in higher volumes of transactions supplied with a higher level of risk of fraud and deposition of the financial security and consumer confidence. Older rule-based based detection techniques have difficulties with keeping up with changing tactics of the fraudster, necessitating more security systems. This paper believes that a machine learning model of e-commerce fraud detection is the best approach to enhance accuracy and scalability and it makes use of transaction history, user behaviour and metadata. An ANN with support delivered by Synthetic Minority Over-sampling Technique (SMOTE) to balance the classes and Linear Discriminant Analysis (LDA) to extract features, resulted in a hybrid model with a 95.46 percent accuracy and 97.04 percent AUC. Such outcomes are much better than traditional methods and minimize the level of false positives and few false negatives. The results show the possibility of state-level machine learning to enhance internet security and protect the digital market and other sensitive sectors like healthcare. The paper highlights the value of consumer faith in the online economy through the implementation of adaptable, explainable, and profitable systems of fraud detection.

Keywords

E-commerce, Fraud Detection, Machine Learning, Artificial Neural Networks (ANN), Deep Neural Networks (DNN), SMOTE, LDA, Online Transactions, Digital Economy.