

**IMPROVED CREDIT CARD FRAUD DETECTION USING  
DEEP LEARNING  
(DEEP NEURAL FRAUD DETECTOR)**

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## **Abstract**

Any form of unauthorized credit card transaction activity can be considered fraudulent activity. This attack type has already caused massive financial losses worldwide and will be causing a big impact because money is now handled digitally. According to the brief literature review on the domain and the relevant technology, the author identified the gaps in existing research work using various machine learning and neural network techniques. Moreover, the lack of usage of deep learning techniques was another research gap in this domain.

This research project considers convolutional neural network, Bidirectional LSTM, and autoencoder to implement three separate deep neural network models, and each model was trained, validated, and tested using a European dataset of 30 different attributes. After a comparative model analysis, LSTM and the Deep CNN models were selected for final prototype testing. The author created a python web application hosted locally to demonstrate the usefulness of developing these machine learning models. The Bidirectional LSTM model was integrated with the web application, and the integrated system was tested manually, sending transaction data values to determine if the model predicted accurately.

This dissertation is a massive contribution to the research domain and has created a broad future scope. This prototype has the potential to detect credit card fraud patterns if trained more under real-time transaction data values integrated into a real-world system/network architecture.

Keywords: Credit Card Fraud Detection, Deep Learning, Bi-Directional LSTM, Convolutional Neural Networks, Autoencoders.