Hybrid Neural Network Methods for the Detection of Credit Card Fraud

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Abstract The purpose of research on fraud detection is to discover methods that are superior and more effective in detecting fraudulent activity. Because of the difficulties that are associated with single models, this research proposes a hybrid model neural network be utilized in order to overcome such difficulties. A very effective binary classification system is produced as a result of the multimodal neural network (MNN) model, which combines continuous and categorical data channels. The hybrid model neural network model demonstrates some extraordinary effectiveness in detecting cases

of credit card fraud, according to the results of experimental investigation. The findings on accuracy, precision, recall, and area under the curve (AUC) give evidence of its robustness and reliability in identifying fraudulent transactions while simultaneously reducing the number of false positives and false negatives. In particular, it proved that the performance of the model is exceptional, with a test accuracy of 99.47%, precision of 99.82%, recall of 97.87%, and an AUC of 98.99%. Furthermore, these findings provide evidence of a robust model that is capable of effectively detecting fraudulent transactions with a high degree of accuracy, while simultaneously lowering the occurrence of both false positives and false negatives. Consequently, this guarantees a fraud detection system that is dependable and effective.

Keywords **Author Keywords:** artificial intelligence; fraud; fraud detection; hybrid-neural network; machine learning

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