

Credit Card Fraud Detection

Batch No: 02

Name of the Guide: Dr. Durga Prasad K
Designation: Sr. Assistant Professor

- 1. 22071A6622- J. Hariharan**
- 2. 22071A6628- K. Venu Madhav**
- 3. 22071A6638- M. Khyathi Meghana**
- 4. 23075A6602- E. Nandhu**

Abstract

Focused on improving credit card fraud detection, this paper examines the efficacy of machine learning (ML) algorithms. It explores various ML methods, including logistic regression, decision trees, random forests, SVMs, and neural networks, comparing their performance metrics. Data preprocessing techniques, feature engineering, and interpretability methods are discussed. Experimental evaluations on synthetic and real-world datasets demonstrate promising results, with some models achieving over 90% accuracy. This research contributes to developing robust fraud detection systems, beneficial for financial institutions and consumers alike.

Introduction

In an era dominated by credit card transactions, the specter of fraud poses substantial risks to both financial institutions and consumers. This paper delves into the realm of credit card fraud detection, assessing the effectiveness of various machine learning (ML) algorithms such as logistic regression, decision trees, random forests, SVMs, and neural networks. By comparing their performance metrics and exploring data preprocessing techniques, feature engineering, and interpretability methods, the study aims to bolster the discriminatory power of fraud detection systems. Through rigorous experimental evaluations on synthetic and real-world datasets, the research reveals promising results, with certain ML models achieving over 90% accuracy. This contribution not only advances the field of fraud detection but also enhances the security and trustworthiness of financial transactions, benefiting both stakeholders in the financial ecosystem.

Literature Survey

S.No	Title of the Paper	Title of the Journal	Reference with DOI	Problem or gap addressed	Objective of the paper	Focus of the paper(discuss methods used)	Summary
------	--------------------	----------------------	--------------------	--------------------------	------------------------	--	---------

LITERATURE SURVEY



[https://vnrviethyd-my.sharepoint.com/:w:/g/personal/20071a6630_vnrviethyd-my.sharepoint.com?e=HbRNw1](https://vnrviethyd-my.sharepoint.com/:w:/g/personal/20071a6630_vnrviethyd-my.sharepoint.com/:w:/g/personal/20071a6630_vnrviethyd-my.sharepoint.com/:w:/g/personal/20071a6630_vnrviethyd-my.sharepoint.com?e=HbRNw1)



Microsoft Word
Document

Existing System

- Present credit card fraud detection systems combine rule-based algorithms with machine learning.
- They feature real-time transaction monitoring and anomaly detection.
- Behavior analysis and advanced authentication methods are employed.
- Systems continuously evolve to counter new fraud tactics and meet regulatory standards.
- Collaboration with industry peers and user education are emphasized.
- Integration with fraud intelligence networks ensures updated fraud prevention measures.

Research Gap Identified

The challenges encountered or gaps identified in credit card fraud detection can be classified into three main categories:

1. Data-related Challenges:

- 1.1 Class imbalance;
- 1.2 Lack of real data;
- 1.3 Data drift/shift;
- 1.4 Data overlapping.

2. Security-related Challenges: These challenges primarily revolve around preserving the privacy of individuals' sensitive information while implementing fraud detection measures.

3. Security-related Challenges :

- 3.1 Time Complexity

Proposed System

- The proposed credit card fraud detection system integrates advanced machine learning algorithms.
- It employs supervised learning techniques such as logistic regression, decision trees, and neural networks.
- Data preprocessing techniques, including feature scaling and outlier detection, enhance model performance.
- Imbalanced data handling methods such as oversampling or under sampling are implemented to address skewed datasets.
- Feature engineering methods like PCA and feature selection algorithms optimize model efficiency.
- Real-time transaction monitoring and anomaly detection are key features for timely fraud detection.
- Continuous model updates and retraining ensure adaptability to evolving fraud patterns.
- The system emphasizes user-friendly interfaces and seamless integration with existing banking platforms.
- Regular audits and compliance checks are conducted to meet regulatory requirements and ensure data privacy.
- Collaboration with fraud intelligence networks and sharing of insights further strengthens fraud prevention measures.

Technical Specifications

1. Programming Language: System will be developed using machine Learning.
2. Machine Learning Framework: System will leverage popular machine learning libraries and framework such as scikit-learn, TensorFlow, PyTorch.
3. Database Management System: A robust DBMS such as MySQL is used to store transaction.
4. Data Processing tools: pandas and NumPy.

Thank you

Note : Please maintain the decorum of the slides and abide to this format to maintain the uniformity