Introduction to Credit Card Fraud Detection

Credit card fraud is the unauthorized use of a credit card to make purchases or obtain cash. It is a growing problem that costs businesses and consumers billions of dollars each year. Understanding the different types of credit card fraud and the data sources used to detect it is crucial for effective prevention.

By
Maha Swetha AS
CSE- 3rd /KVCET
NMN id: AU421221104019
E-mail: rubeshkanna2000@gmail.com

Types of Credit Card Fraud

Application Fraud

Using stolen or fake identities to open new credit card accounts.

Card-Present Fraud

Unauthorized use of a physical credit card for in-person transactions.

Card-Not-Present Fraud

Unauthorized use of credit card information for online or over-the-phone transactions.

Account Takeover

Gaining unauthorized access to an existing credit card account.

Data Sources for Fraud Detection

Transaction Data

Includes details like purchase amount, location, and timing.

Customer Behavior

Analyzes a customer's typical spending patterns and habits.

External Data

Leverages data from public records, social media, and other sources.

Machine Learning Techniques

1

Supervised Learning

Trains models on labeled data to identify known fraud patterns.

2

Unsupervised Learning

Identifies anomalies and outliers in data to detect unknown fraud.

3

Ensemble Methods

Combines multiple models to improve accuracy and robustness.

Feature Engineering for Fraud Detection

1

Transaction Amount

Unusual or significantly high transaction amounts can indicate fraud.

2

Merchant Category

Certain merchant categories are more prone to fraudulent activities.

3

Geolocation

Sudden changes in transaction locations can suggest account takeover.

4

Temporal Patterns

Detecting abnormal transaction timing and frequency helps identify fraud.

Evaluation Metrics for Fraud Models

Accuracy	Overall correctness of the model's predictions.
Precision	Proportion of true positives among all positive predictions.
Recall	Proportion of true positives captured among all actual positives.
F1-Score	Harmonic mean of precision and recall, balancing both metrics.

Challenges in Fraud Detection

1

Data Imbalance

Fraudulent transactions are rare compared to legitimate ones.

2

Evolving Fraud Tactics

Fraudsters continuously adapt their methods to bypass detection.

3

Operational Constraints

Balancing fraud prevention with customer experience and efficiency.

Conclusion and Future Trends

AI-Driven Fraud Detection

Leveraging advanced machine learning and deep learning techniques.

Blockchain-Based Solutions

Utilizing distributed ledger technology to enhance transaction security.

Biometric Authentication

Incorporating biometric data like fingerprints or facial recognition.

Industry Collaboration

Sharing data and best practices to combat fraud more effectively.