

## Digital Finance 3: Technology in Finance

### Lesson 31: Fraud Detection and AML

FHGR

December 13, 2025

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**Summary of key concepts presented above.**

## Learning Objectives

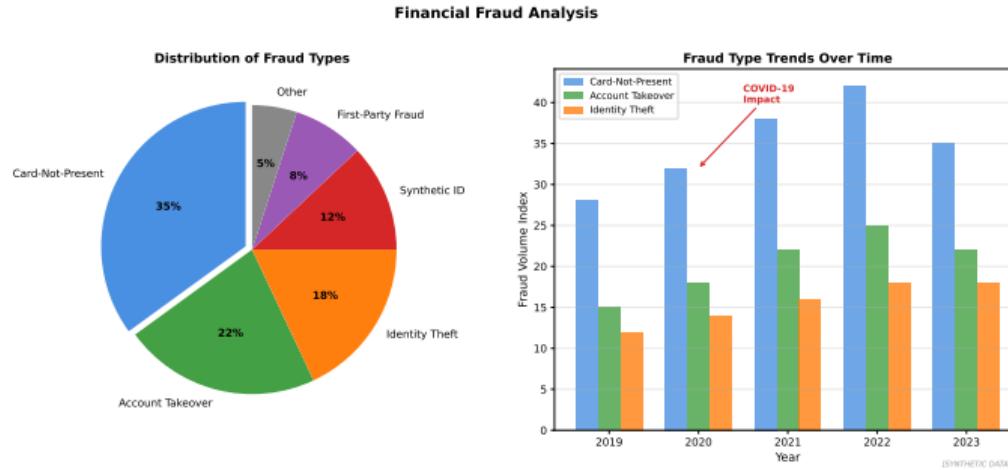
By the end of this lesson, you will be able to:

- Classify different types of financial fraud
- Design ML-based fraud detection systems
- Understand real-time scoring architectures
- Apply anomaly detection techniques
- Balance precision and recall in fraud detection
- Explain AML compliance requirements

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**Summary of key concepts presented above.**

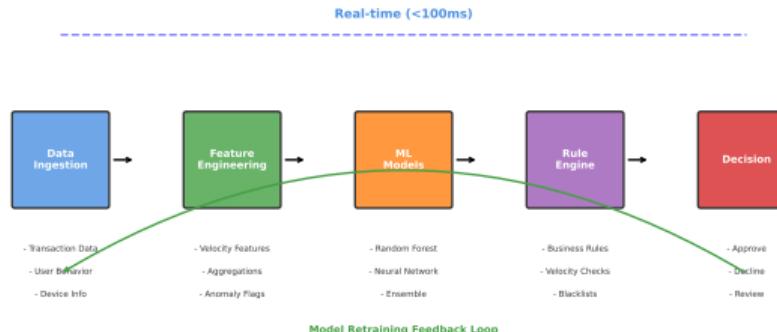
# Fraud Types Distribution



Credit card fraud, identity theft, and account takeover are the most common fraud types in finance.

# Fraud Detection Pipeline

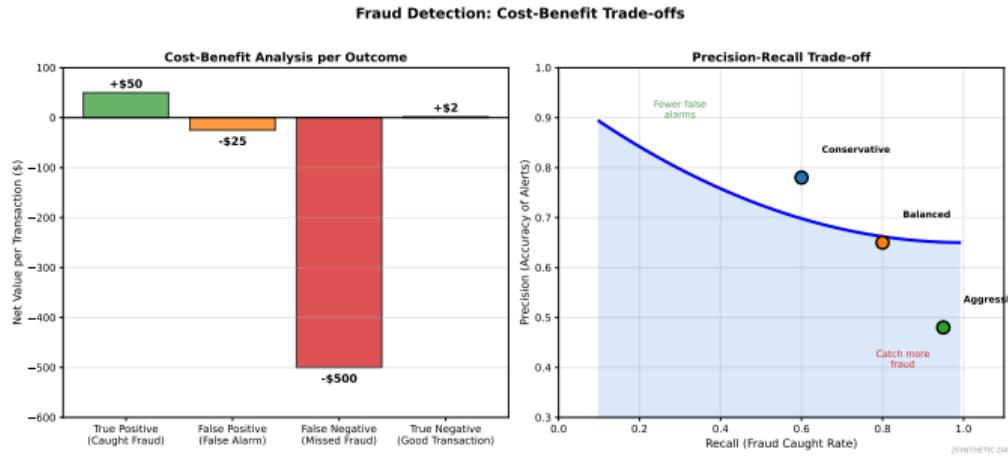
Fraud Detection Pipeline Architecture



[SYNTHETIC DATA]

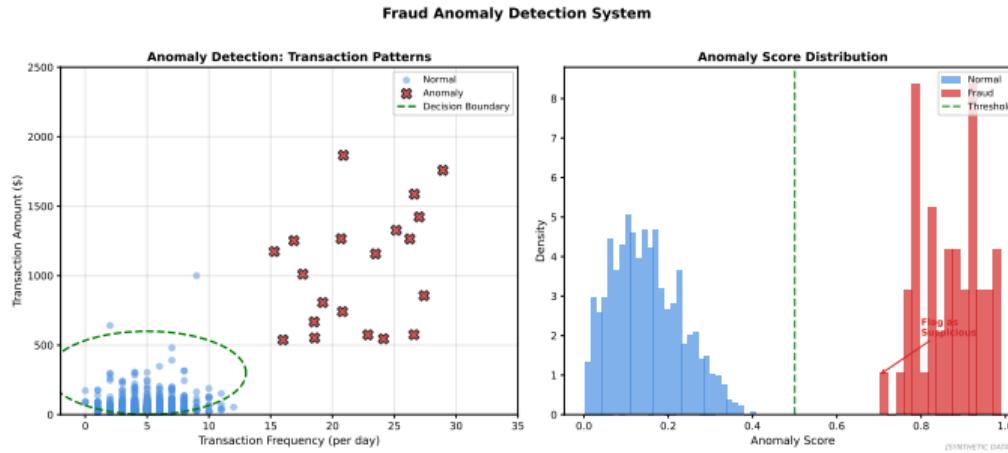
Modern fraud detection systems combine rules-based filtering with ML models for real-time scoring.

# Fraud Cost-Benefit Analysis



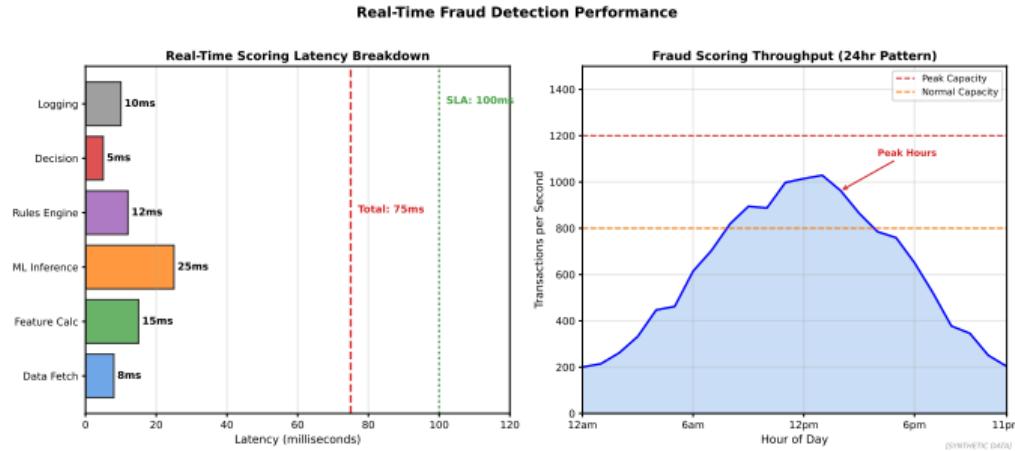
Optimal fraud thresholds balance fraud losses against customer friction from false positives.

# Anomaly Detection Techniques



Unsupervised methods detect anomalies by identifying patterns that deviate from normal behavior.

# Real-Time Scoring Architecture



Real-time fraud systems must score transactions in milliseconds to avoid payment delays.

## Key Takeaways:

- ML significantly improves fraud detection accuracy
- Real-time scoring essential (sub-100ms latency)
- Class imbalance major challenge (0.1-1% fraud rate)
- Anomaly detection for new fraud patterns
- Cost-benefit analysis determines thresholds
- AML compliance requires explainable models

**Next Lesson:** NLP in Finance

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Summary of key concepts presented above.