

AI-Driven Fraud Detection in Banking

Duration: 5 Days

Language: en

Course Code: PI2 - 123

Objective

By the end of this course, participants will be able to:

- Understand the landscape of fraud in digital banking systems.
- Explore how AI and machine learning are used to detect financial fraud.
- Analyze transaction and behavior data to identify red flags and risk signals.
- Build and evaluate machine learning models for fraud detection.
- Apply anomaly detection and graph analytics for real-time fraud monitoring.
- Address model drift, false positives, and regulatory compliance challenges.
- Integrate AI models into fraud detection pipelines and banking systems.

Audience

This course is ideal for:

- Fraud analysts and banking risk professionals.
- Data scientists and AI engineers in financial institutions.
- Information security and compliance officers.
- Banking operations and transaction monitoring teams.
- IT managers developing fraud prevention infrastructure.
- Fintech professionals building AI-powered anti-fraud tools.

Training Methodology

The course blends technical instruction with practical labs, case study analysis, and simulation exercises. Participants will use Python and real banking datasets to build fraud detection models, test various algorithms, and apply evaluation metrics. Interactive discussions focus on ethical and operational challenges.

Summary

As banking transactions become increasingly digital and complex, so do the methods used by fraudsters. Traditional rule-based fraud detection systems are no longer sufficient to combat sophisticated and evolving threats. Artificial Intelligence (AI) offers a smarter, faster, and more scalable approach—using real-time data analysis, pattern recognition, and anomaly detection to identify suspicious activity before it causes damage.

This course introduces participants to modern fraud detection techniques powered by AI, including supervised and unsupervised learning, deep learning, and graph-based approaches. Through hands-on exercises, real-world case studies, and ethical discussions, participants will learn how to build and deploy fraud detection models tailored to banking environments.

Course Content & Outline

Section 1: Fraud in the Digital Banking Era

- Types of financial fraud: identity theft, transaction fraud, phishing, synthetic accounts
- The evolving nature of fraud in online and mobile banking
- Limitations of traditional fraud detection systems
- How AI enhances fraud detection: speed, adaptability, and automation
- Industry case studies: AI catching fraud before it spreads

Section 2: Data for Fraud Detection

- Key data sources: transactions, login behavior, geolocation, device metadata
- Feature engineering for fraud: velocity, frequency, amount deviation
- Exploratory data analysis (EDA) on fraud patterns
- Data labeling, class imbalance, and synthetic data generation
- Lab: Prepare and explore fraud data using Python and Pandas

Section 3: Machine Learning Models for Fraud Detection

- Supervised learning: decision trees, random forests, gradient boosting
- Unsupervised learning: clustering and isolation forests for unknown fraud
- Deep learning for detecting complex fraud patterns in sequences
- Evaluation metrics: precision, recall, F1, cost of false positives
- Workshop: Train and validate a fraud detection model on transactional data

Section 4: Real-Time Detection, Alerts, and Anomaly Monitoring

- Stream processing for real-time detection: Kafka, Spark, and APIs
- Building real-time alerting systems using AI triggers
- Graph analytics for network-based fraud (e.g., money mule networks)
- Addressing adversarial attacks and evolving fraud behavior
- Integration with banking platforms and automated action systems

Section 5: Governance, Ethics, and Operationalization

- Regulatory considerations (e.g., PSD2, AML laws, GDPR compliance)
- Managing model drift and ensuring explainability in high-stakes contexts
- Balancing detection accuracy with customer experience
- Transparent reporting and audit trails in AI-driven systems
- Final project: Present a fraud detection strategy and model architecture

Certificate Description

Upon successful completion of this training course, delegates will be awarded a Holistique Training Certificate of Completion. For those who attend and complete the online training course, a Holistique Training e-Certificate will be provided.

Holistique Training Certificates are accredited by The CPD Certification Service (CPD), and are certified under ISO 9001 and ISO 29993 standards.

CPD credits for this course are granted by our Certificates and will be reflected on the Holistique Training Certificate of Completion. In accordance with the standards of The CPD Certification Service, one CPD credit is awarded per hour of course attendance. A maximum of 50 CPD credits can be claimed for any single course we currently offer.

Categories

AI, Data and Visualisation, Banking and Finance, Technology

Tags

AI-Driven Banking, AI-Driven Fraud Detection

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