



CONF42 MACHINE LEARNING 2026

FEBRUARY 19 • ONLINE

The Role of Machine Learning in Today's Payment Ecosystem

Understanding ML from a System and Ecosystem Perspective

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Conf42 ML 2026

About the speaker



16+ Years in large-scale financial systems



Deep experience in payments platform & enterprise architecture



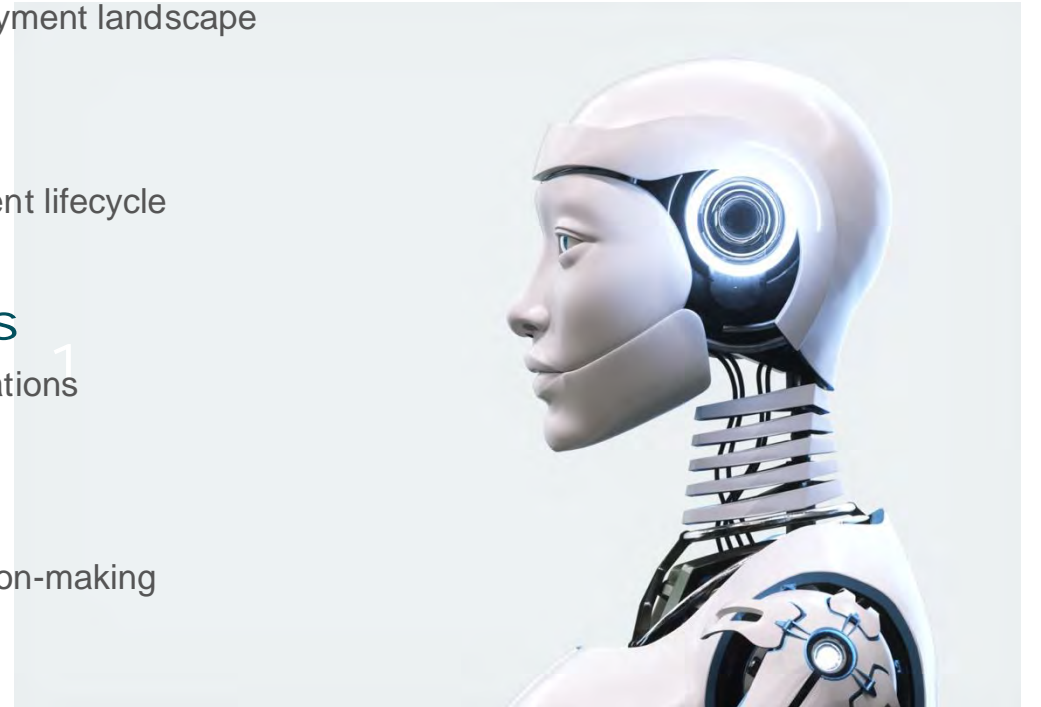
Practical adoption of machine learning in production environments

Session Focus

This talk bridges real-world payment challenges with applied machine learning – examining ML from a system and ecosystem perspective, not just algorithms

What We'll Cover Today

- 1** The Modern Payment Ecosystem
Understanding today's complex payment landscape
- 2** Where ML Fits
Key touchpoints across the payment lifecycle
- 3** Real-World Applications
Acquisition, processing, and operations¹
- 4** System-Level Benefits
Scalability, automation, and decision-making
- 5** The Future
Evolving with technology and customer needs



The Modern Payment Ecosystem

Today's payment platforms are complex, interconnected systems



Merchant Acquisition

Onboarding & underwriting



Transaction Processing

Real-time authorization



Fraud Detection

Risk assessment & prevention



Settlement

Fund movement & reconciliation



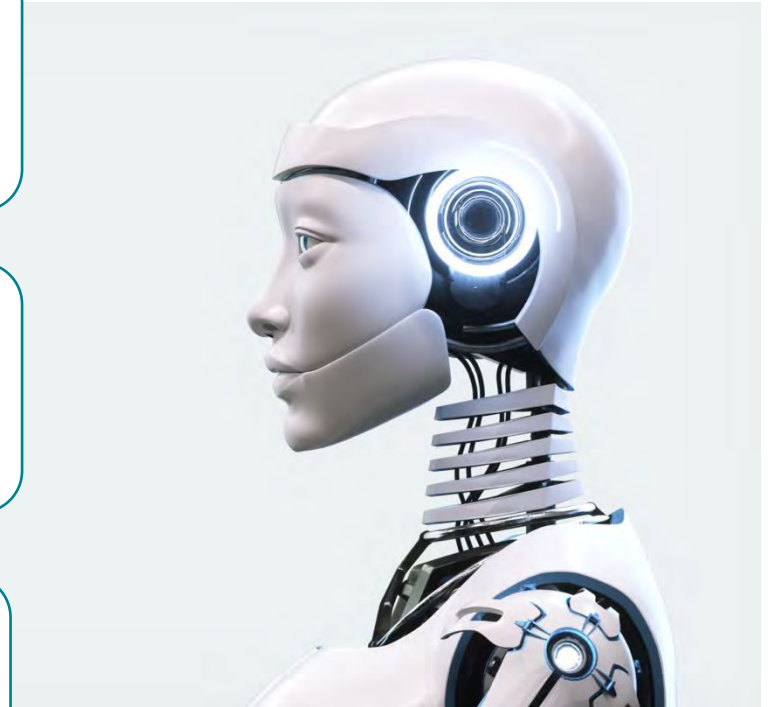
Analytics

Business intelligence



Operations

Platform optimization



Key Challenge: These systems must handle millions of transactions with low latency, high accuracy, and continuous adaptation to evolving patterns.

Why Machine Learning Matters Now

The Traditional Approach

- Rule-based systems with static thresholds
- Manual reviews and interventions
- Periodic batch processing
- Reactive to fraud patterns
- Limited personalization
- Slow to adapt to change

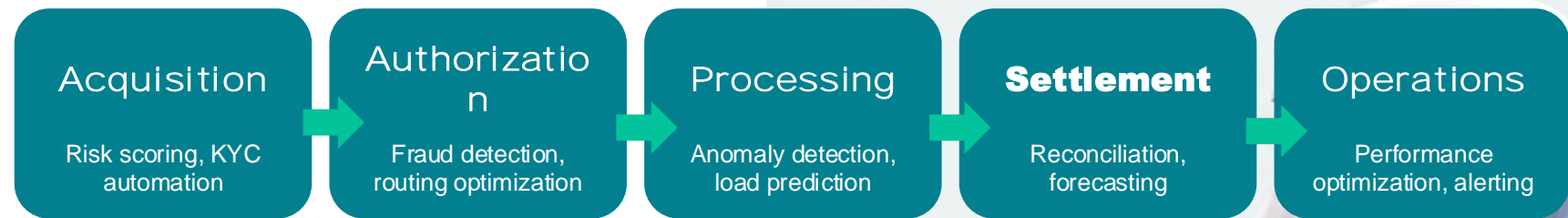
The ML-Enhanced Approach

- ✓ Adaptive models that learn from data
- ✓ Automated decision-making at scale
- ✓ Real-time stream processing
- ✓ Predictive and proactive
- ✓ Personalized experiences
- ✓ Continuous improvement


ML enables payment systems to operate more intelligently and efficiently

ML Across the Payment Lifecycle


Machine learning touches every stage of the payment journey



Cross-Cutting ML Capabilities




Pattern Recognition
Identifying trends in transaction data



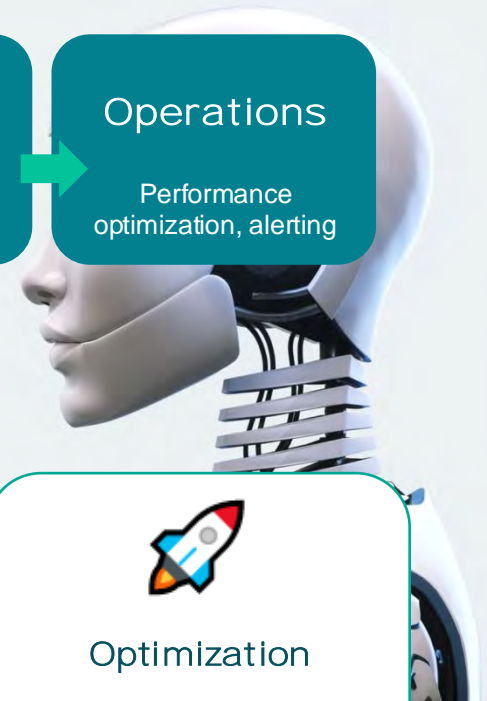
Risk Assessment
Real-time evaluation of transaction risk



Predictive Analytics
Forecasting behavior and outcomes



Optimization
Improving routing and resource allocation



Application: Merchant Acquisition

The Challenge

Traditional merchant onboarding is slow, manual, and inconsistent. Underwriters review applications one by one, leading to bottlenecks and subjective decisions. The process can take days or weeks, creating friction for merchants.

How ML Helps

ML models automatically assess merchant risk by analyzing business type, financial history, transaction patterns, and external data sources. This enables instant decisions for low-risk merchants and intelligent routing of edge cases to human reviewers.

Business Impact

90%

Reduction in processing
time

75%

Decrease in manual
reviews

40%

Improvement in risk
detection



Application: Transaction Processing

The Challenge

Payment authorization happens in milliseconds. Systems must distinguish legitimate transactions from fraud without adding latency. Static rules create false positives, frustrating customers and losing revenue.

How ML Helps

Real-time ML models score every transaction based on hundreds of features: device fingerprints, location, velocity patterns, merchant category, and historical behavior. Models continuously learn from feedback, adapting to new fraud patterns.

Key ML Capabilities in Real-Time Processing



Fraud Scoring

Real-time risk assessment in <100ms



Routing Intelligence

Optimizing approval rates by network selection



Anomaly Detection

Identifying unusual patterns instantly



Dynamic Thresholds

Adjusting rules based on context

Application: Operational Decision Making

The Challenge

Payment platforms generate massive operational data. Human teams struggle to monitor system health, predict capacity needs, and optimize resources. Reactive approaches lead to downtime and inefficiency.

How ML Helps

ML models predict traffic patterns, detect infrastructure anomalies before they impact customers, and optimize resource allocation dynamically. This enables proactive operations and intelligent automation at scale.

Operational Use Cases

Capacity Planning

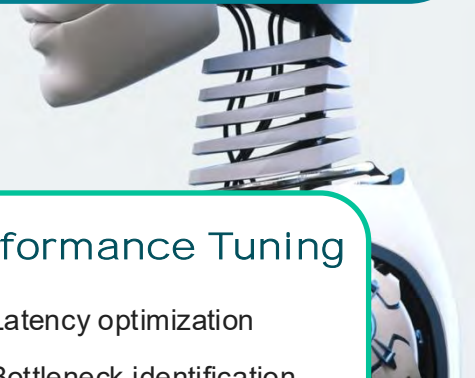
- Load forecasting
- Auto-scaling triggers
- Resource optimization

Incident Detection

- Anomaly alerting
- Root cause analysis
- Automated remediation

Performance Tuning

- Latency optimization
- Bottleneck identification
- Configuration tuning



System-Level Benefits of ML

Beyond individual applications, ML transforms the entire payment ecosystem



Scalability

- ✓ Handles millions of transactions without linear cost increase
- ✓ Adapts to traffic spikes automatically
- ✓ Enables global expansion without proportional team growth



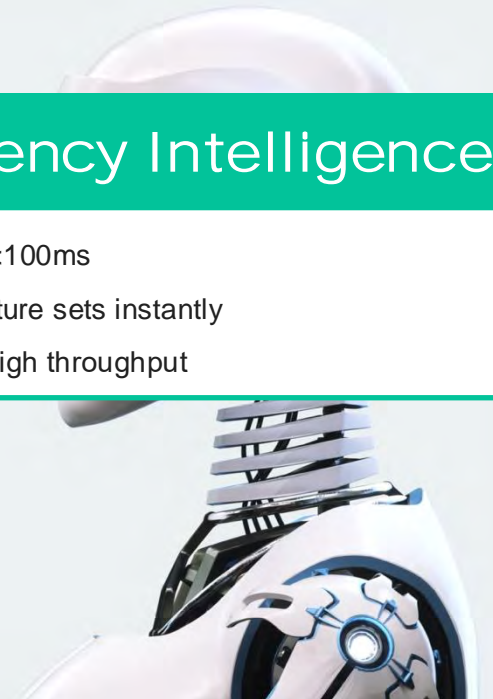
Automation

- ✓ Reduces manual intervention from 50% to <5% of cases
- ✓ Frees human experts for complex edge cases
- ✓ Enables 24/7 operation without human oversight



Low-Latency Intelligence

- ✓ Real-time decisions in <100ms
- ✓ Processes complex feature sets instantly
- ✓ Maintains accuracy at high throughput



The ML Ecosystem View

ML is not just a feature—it's a foundational layer

Business Layer

Merchants, Customers, Partners

Application Layer

Payments, Fraud, Analytics, Operations

ML Intelligence Layer

Models, Predictions, Insights, Automation

Data Layer

Transactions, Events, User Behavior, System Metrics

The ML Intelligence Layer acts as a central nervous system, connecting data to applications and enabling smart decisions across the entire ecosystem.

Challenges & Considerations

ML adoption in payments requires thoughtful implementation



Data Quality & Availability

Models are only as good as the data they're trained on. Missing data, biased samples, and data quality issues can undermine performance.



Model Explainability

Regulatory requirements and business needs demand transparency. Black-box models must be balanced with interpretability.



Real-Time Constraints

Payment decisions happen in milliseconds. Models must be optimized for latency without sacrificing accuracy.



Continuous Monitoring

Fraud patterns evolve, customer behavior shifts. Models require ongoing monitoring and retraining to stay effective.



Integration Complexity

ML systems must integrate with existing payment infrastructure, legacy systems, and compliance requirements.



Risk Management

Errors in payment systems have real financial impact. Robust fallbacks and human oversight remain essential.

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The Future of ML in Payments

Evolving with technology and customer expectations

Embedded Finance

ML enables seamless payment experiences embedded in everyday applications

Real-Time Personalization

Dynamic offers, pricing, and experiences tailored to individual users

Cross-Border Intelligence

Smarter routing, currency optimization, and compliance for global payments

Alternative Payments

ML adapts to crypto, BNPL, and emerging payment methods

Autonomous Operations

Self-healing systems that predict and resolve issues before impact

ML is not just improving payments—it's redefining what's possible in the payment ecosystem



Key Takeaways

ML is a foundational layer in modern payment ecosystems, not just an add-on feature

It enhances every stage of the payment lifecycle—from acquisition to settlement to operations

The system-level benefits—scalability, automation, and low-latency intelligence—are transformative

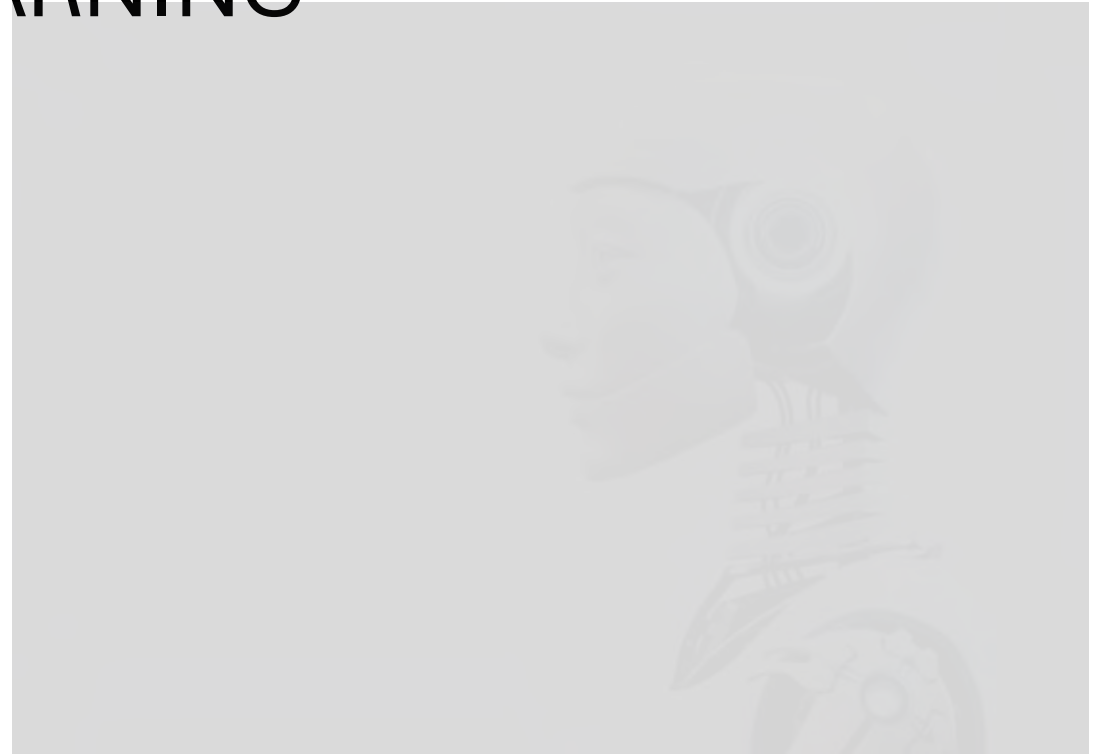
Success requires thoughtful consideration of data quality, explainability, and integration

ML enables payment platforms to evolve alongside emerging technologies and customer expectations

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DEMO – EVENT DRIVEN FRAUD DETECTION USING MACHINE LEARNING



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