

International Conference on AI, Data Science, Cybersecurity, Cloud Architectures, and Software Engineering

Conference Proceedings

April 22, 2026 - Germany

From Market Noise to Signal: Machine Learning and Quantitative Alpha in Financial Markets

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Abstract

Theme

The convergence of Artificial Intelligence (AI), Quantitative Finance, and Blockchain technologies is reshaping how capital is analyzed, deployed, and optimized across both traditional and decentralized markets.

Core Focus

- **Evolution of Trading:** From structured Wall Street quant models to decentralized, data-driven Web3 ecosystems.
- **AI/ML in Action:** Transforming market “noise” into predictive signals through reinforcement learning, deep neural networks, and regime-detection models.
- **Systematic Risk Control:** Application of institutional-grade portfolio management—drawdown control, position sizing, and multi-asset allocation—to highly volatile crypto markets.

Methodology & Frameworks

- Integration of AI/ML models with advanced backtesting and optimization platforms such as **StrategyQuant** and **LuxAlgo**, validated through out-of-sample and Monte Carlo testing.
- Use of **on-chain analytics**, order-flow intelligence, and sentiment data to enhance predictive accuracy.
- Emphasis on **robustness and transparency**—bridging quantitative rigor and explainable AI for practical deployment.

Applications

- Democratization of institutional-grade tools for retail traders and family offices.
- Quantitative wealth-management frameworks for decentralized funds, DAOs, and algorithmic asset allocators.
- Emergent AI-agent and blockchain-based ventures building the next generation of autonomous trading, custody, and analytics infrastructure.

Key Insight

By uniting quantitative discipline, AI innovation, and venture execution, this research proposes a scalable framework for transforming market complexity into actionable clarity—and for capturing sustainable alpha in the next era of intelligent, decentralized finance.