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AI-Driven Treasury Management: Reinforcement Learning Models for Liquidity Optimization and Fraud Prevention in Large-Scale Financial Institutions

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AI-driven treasury management is transforming financial institutions by leveraging reinforcement learning models to optimize liquidity and enhance fraud prevention. This study explores how AI-powered algorithms analyze real-time financial data, predict cash flow trends, and dynamically allocate liquidity to maximize capital efficiency. Reinforcement learning enables adaptive decision-making, allowing treasury systems to respond proactively to market fluctuations, interest rate changes, and regulatory requirements. Additionally, AI-driven fraud detection mechanisms use anomaly detection and predictive analytics to identify suspicious transactions, mitigate risks, and strengthen financial security. The research highlights key challenges, including data privacy, model interpretability, and integration with legacy financial systems, while proposing strategies to enhance AI adoption in treasury management. By combining reinforcement learning with big data and cloud computing, large-scale financial institutions can achieve greater operational resilience, improved risk management, and a more agile approach to liquidity optimization and fraud prevention.