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AI-Driven Wealth Creation and Management: A Hybrid DL-RL-MOO Framework

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Abstract

Artificial Intelligence (AI) has transformed wealth creation by enabling data-driven financial decisions, yet many systems lack adaptability to dynamic markets and integration between prediction and optimization. This study proposes a hybrid framework combining Deep Learning (DL), Reinforcement Learning (RL), and Multi-Objective Optimization (MOO) for adaptive wealth management.

The framework includes four stages: data preprocessing, predictive modeling, investment optimization, and performance evaluation. Experiments used real financial data such as S&P 500, cryptocurrency indicators, and macroeconomic variables. The model was compared with Linear Regression, SVM, and LSTM using prediction accuracy, ROI, and drawdown. Results show higher returns, improved accuracy, lower risk, and robust performance under market shocks, supporting scalable intelligent investment systems.

Keywords: Artificial Intelligence, Deep Learning, Reinforcement Learning, Multi-Objective Optimization, Wealth Management, Algorithmic Trading, FinTech, Predictive Analytics

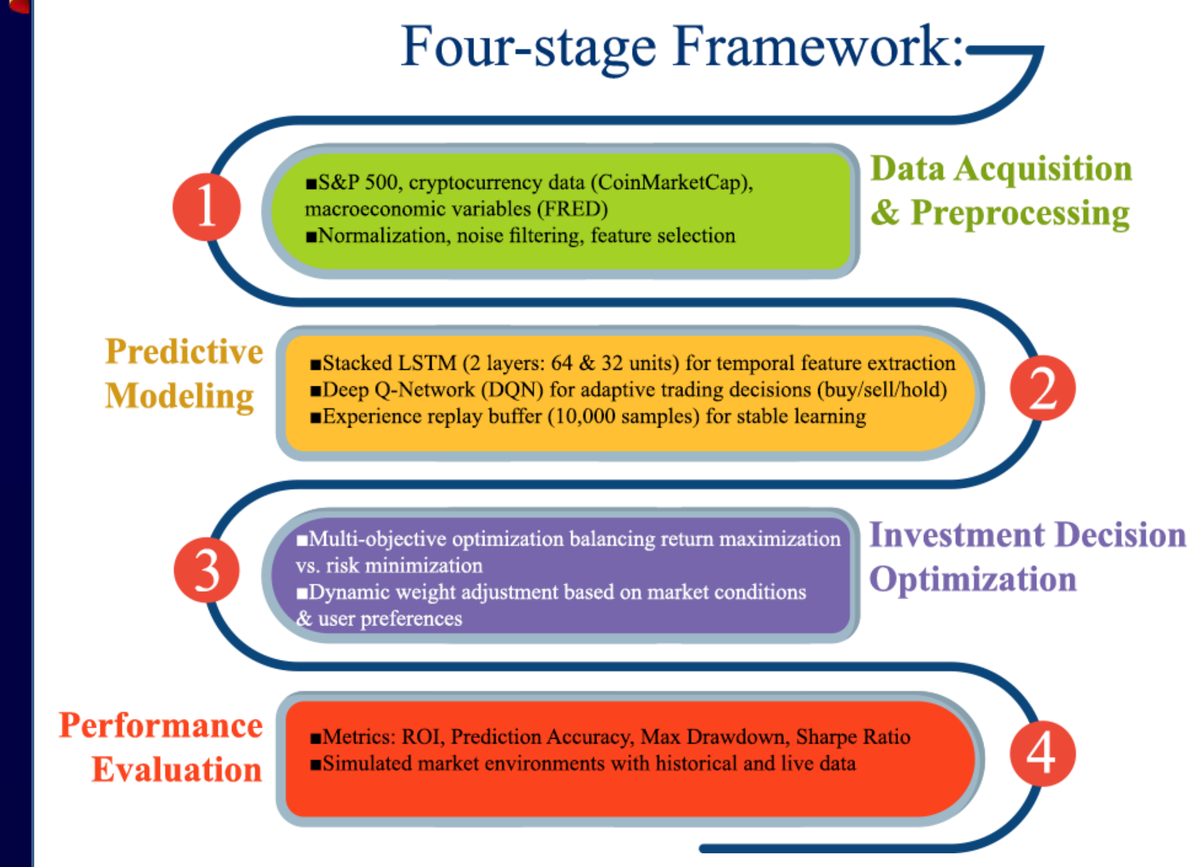
Introduction & Problem Statement

- AI is increasingly transforming wealth management and investment strategies
- Current systems focus mainly on prediction accuracy, not adaptive decision-making
- Key Challenge: Lack of unified framework integrating market prediction with real-time investment optimization under dynamic conditions

Research Objective

- Propose a hybrid framework combining Deep Learning (DL), Reinforcement Learning (RL), and **Multi-Objective Optimization (MOO)
- Develop system capable of simultaneous market prediction and adaptive portfolio optimization

Proposed Methodology



Key Results

Additional Findings:

- 22% faster loss recovery** during market shocks vs. LSTM
- Robust performance under noisy conditions (only 2.3% accuracy degradation)
- Consistent across bullish, bearish, and sideways markets
- Statistically significant improvements ($p < 0.05$, 95% confidence)

Model	ROI (%)	Accuracy
Linear Regression	7.8	69.2
SVM	9.3	73.5
LSTM	12.4	79.8
Proposed Hybrid	14.6	85.7

Conclusion & Contributions

- First integrated DL-RL-MOO framework for wealth management
- Bridges gap between prediction accuracy and adaptive decision-making
- Key Contributions:
- Unified architecture combining temporal learning with strategy optimization
- Dynamic risk-return balancing via MOO
- Validated robustness across multiple asset classes and market conditions
- Future work: Explainable AI, multi-agent RL, real-time online learning

Selected References↓

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