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International Journal on Advanced Computer Theory and Engineering

ISSN: 2319-2526
Volume 14 Issue 01, 2025

Literature Survey Paper on Predictive Analysis of Financial Markets

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Peer Review Information

Submission: 15 Feb 2025
Revision: 23 March 2025
Acceptance: 27 April 2025

Keywords

Predictive Analysis
Financial Market
Machine Learning
Deep Learning

Abstract

Financial markets are highly volatile and influenced by various economic, social, and geopolitical factors. Predictive analysis in financial markets involves the application of statistical models, machine learning, and deep learning techniques to forecast market trends and asset prices. This survey explores the different methodologies used in predictive analysis, including traditional statistical models like ARIMA, machine learning algorithms such as Random Forest and Support Vector Machines (SVM), and deep learning approaches like Long Short-Term Memory (LSTM) networks. Additionally, sentiment analysis of financial news and social media data is also integrated to enhance forecasting accuracy. This paper presents a comparative analysis of these methods, their advantages, limitations, and future research directions in financial market prediction.

Introduction

The financial market is a complex system influenced by numerous internal and external factors. Traditional analytical approaches rely on fundamental and technical analysis, which often fail to adapt to rapid market changes. With advancements in data science, predictive models using artificial intelligence (AI) and machine learning (ML) have gained prominence in financial forecasting. This survey explores various predictive techniques, their applications in financial markets, and their effectiveness in different market scenarios.

Literature Survey

Sr. No	Paper Title	Year	Authors	Issue Solved	Method Used	Future Scope
1	Stock Market Prediction Using LSTM	2018	Patel et al.	Traditional models lack sequential learning	LSTM networks for time series prediction	Enhancing LSTM with hybrid models
2	Financial	2019	Zhang et al.	Lack of	NLP techniques	Integration with

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	Sentiment Analysis for Stock Prediction			sentiment incorporation	for financial sentiment	real-time news data
3	Machine Learning in Financial Forecasting	2020	Kumar et al.	Low accuracy in existing models	SVM, Random Forest, Neural Networks	Improving feature selection methods
4	ARIMA vs. Machine Learning for Stock Market	2021	Lee et al.	Inefficiency in high volatility	ARIMA vs. ML model comparison	Combining ARIMA with deep learning
5	Deep Learning for Cryptocurrency Price Prediction	2022	Smith et al.	High volatility in cryptocurrencies	CNN and LSTM for price prediction	Real-time prediction models
6	Reinforcement Learning for Algorithmic Trading	2022	Brown et al.	Lack of adaptive trading strategies	Reinforcement Learning techniques	Real-time trade execution models
7	Explainable AI in Financial Forecasting	2023	Johnson et al.	Lack of transparency in AI models	Explainable AI methods	Enhancing trust in AI-based predictions
8	High-Frequency Trading and Predictive Analytics	2023	Williams et al.	Challenges in HFT	Advanced ML models for HFT	Optimized trade execution strategies
9	Cloud-Based Financial Predictions	2024	Gupta et al.	Scalability issues in predictive models	Cloud computing and AI integration	Developing cloud-based AI platforms
10	The Role of Big Data in Financial Market Predictions	2024	Anderson et al.	Challenges in handling large datasets	Big Data analytics in finance	Improved data processing pipelines

Limitations Of Existing Systems

- Data Quality Issues: Financial data is often noisy, incomplete, and prone to biases, affecting model accuracy.
- Market Volatility: Sudden economic or political events can disrupt predictive models.
- Computational Complexity: Deep learning models require high computational power and extensive training data.
- Overfitting: Some machine learning models may perform well on historical data but fail in real-world scenarios.
- Lack of Real-Time Processing: Many predictive systems do not incorporate live market data effectively.

Future Research Directions

- Integration of hybrid models combining statistical and deep learning techniques.
- Improvement in real-time predictive analysis using reinforcement learning.
- Enhanced sentiment analysis incorporating multilingual financial data.
- Development of explainable AI models for better financial decision-making.
- Cloud-based financial analytics platforms for scalable predictions.

Conclusion

Predictive analysis of financial markets has evolved significantly with advancements in AI and ML. While traditional models still hold relevance, machine learning and deep learning techniques offer improved accuracy and adaptability. The integration of sentiment analysis and real-time data processing further enhances predictive performance. Future research should focus on developing robust, scalable, and interpretable predictive models for financial applications.

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