Submission Overview

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Review Decision Letter

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Article Type

Regular Manuscript

Title

Enhanced LFTSformer: A Novel Long-Term Financial Time Series Prediction Model Using Advanced Feature Engineering and the DS Encoder Informer Architecture

Manuscript Files

Name	Type of File	Size
LFTSformer.zip	Main Document - LaTeX	8.2 MB
Enhanced_LFTSformer__A_Novel_Long_Term_Financial_Time_Series_Prediction_Model_Using_Advanced_Feature_Engineering_and_the_DS_Encoder_Informer_Architect.pdf	Main Document - PDF	7.8 MB

Abstract

This study presents a groundbreaking model for forecasting long-term financial time series, termed the Enhanced LFTSformer. The model distinguishes itself through several significant innovations:
1) **VMD-MIC+FE Feature Engineering:** The incorporation of sophisticated feature engineering techniques, specifically through the integration of Variational Mode Decomposition (VMD), Maximal Information Coefficient (MIC), and feature engineering (FE) methods, enables comprehensive perception and extraction of deep-level features from complex and variable financial datasets.
2) **DS Encoder Informer:** The architecture of the original Informer has been modified by adopting a Stacked Informer structure in the encoder, and an innovative introduction of a multi-head decentralized sparse attention mechanism, referred to as the Distributed Informer. This modification has led to a reduction in the number of attention blocks, thereby enhancing both the training accuracy and speed.
3) GC **Enhanced Adam & Dynamic Loss Function:** The deployment of a Gradient Clipping-enhanced Adam optimization algorithm and a dynamic loss function represents a pioneering approach within the domain of financial time series prediction. This novel methodology optimizes model performance and adapts more dynamically to evolving data patterns.
Systematic experimentation on a range of benchmark stock market datasets demonstrates that the Enhanced LFTSformer outperforms traditional machine learning models and other Informer-based architectures in terms of prediction accuracy, adaptability, and generality. Furthermore, the paper identifies potential avenues for future enhancements, with a particular focus on the identification and quantification of pivotal impacting events and news. This is aimed at further refining the predictive efficacy of the model.

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Is this research supported by funding?

No funding was received for this research

Additional Information

Keywords

- Finance
- Time series analysis
- Transformers

Subject Category

- Computational and artificial intelligence
- Computers and information processing
- Prognostics

Has this manuscript been submitted previously to this journal?

No, it wasn't submitted previously

Informed Consent

No, there were no human subjects

Animal Subjects

There were no animal subjects

Opposed Reviewers

No response provided

Cover letter / Comments

No, I don't have additional comments

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No, this manuscript has never been previously presented or published.

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No, I do not have code associated with my manuscript

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Research Article

History

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