Qeios

Peer Review

Review of: "CryptoPulse: Short-Term Cryptocurrency Forecasting with Dual-Prediction and Cross-Correlated Market Indicators"

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The paper introduces an advanced framework for short-term cryptocurrency forecasting called CryptoPulse. This innovative system pulls together various layers of information to accurately predict the closing prices for the next day. What stands out is its dual-prediction mechanism, which separately analyzes data from the broader market environment and the specific price movements of individual cryptocurrencies. These insights are then combined using a market sentiment-based rescaling approach. On the technical side, the methodology shines by utilizing a diverse range of technical indicators—like Stochastic %K, Stochastic %D, and Williams %R—alongside a fresh sentiment analysis technique that leverages few-shot learning and consistency-based calibration with large language models. This blend aims to tackle the usual shortcomings of feature-driven regression methods, which often overlook the impact of overall market sentiment and macroeconomic factors. The approach is backed by thorough experiments that compare it against various leading time series forecasting models.

Taking a critical look at this, the combination of macro indicators, technical indicators, and sentiment analysis offers a fresh, multi-faceted approach. However, the model's emphasis on predicting the next day raises some concerns about how well it can be applied to longer-term investment strategies. The authors show that they achieve statistically significant improvements in metrics like MAE, MSE, and cross-correlation when stacked against models such as GRU, LSTM, and even some Transformer-based methods. Still, the framework is tailored for short-term forecasting within a seven-day window. This leads us to wonder: would this dual-prediction and cross-correlated indicator method still be beneficial if used in a buy-and-hold strategy over an entire year? More specifically, one might pose this question to

 doi.org/10.32388/1FNU7J

Aukthos: if an investor were to simply buy and hold cryptocurrencies for a year, capturing long-term trends while steering clear of the noise that comes with short-term volatility, how would the CryptoPulse method stack up in terms of profitability? Would the extra signal processing and sentiment adjustments provide a real advantage, or would the benefits be minimal compared to the straightforwardness and low transaction costs of a buy-and-hold approach?

When we look at this from a quantitative perspective, it's essential to evaluate not just if improvements in short-term forecasting can boost returns over a year, but also to consider how factors like transaction costs, market slippage, and the risk of overfitting to short-term changes could chip away at those gains when trades are made continuously over a longer stretch. The paper zeroes in on daily price predictions but doesn't really dive into cumulative returns or risk-adjusted performance within a long-term investment context. It raises an interesting question: could the short-term predictive accuracy—showing a MAE improvement of up to 63.8% and a MSE reduction of as much as 69.0% compared to competitors—actually lead to significantly higher annual profits than a passive investment strategy? This is a vital inquiry because it highlights the fundamental trade-off between active trading strategies that depend on short-term signals and the well-known advantages of holding assets for the long haul in unpredictable markets.

Declarations

Potential competing interests: No potential competing interests to declare.