Time-series Momentum Neural Network Strategy Utilizing Market Trend Dynamic

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ABSTRACT

The time-series momentum trading strategy involves managing trading positions based on the persistence of return trends over specific time intervals. Applying the Long Short-Term Memory (LSTM) deep learning architecture has enhanced the effectiveness of time-series momentum strategies. However, there is a downside to the time-series momentum strategy, as its performance tends to decline during rapid market trend changes. The primary aim is to elevate strategy performance, particularly during critical moments distinguished by significant shifts in both long-term and short-term trends. To accomplish this, a blend of short-term and long-term trends is harnessed to grasp market states comprehensively.

Employing supervised learning methods like XGBoost proves instrumental in seamlessly integrating market trend changes into the model. These alterations are quantified numerically via XGBoost and subsequently merged into a time-series momentum trading strategy, which operates under the guidance of an LSTM network. The model adeptly absorbs these changes through rigorous backtesting on a portfolio comprising 99 continuous futures, enabling it to acclimate to market states and trend shifts, optimizing the Sharpe ratio effectively.

The experiments' conclusion is that adept risk management in time-series momentum trading strategies can lead to consistent profits, particularly during times of market turbulence such as the COVID-19 crisis.

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