Predicting Cryptocurrency Markets Using Kernel U-Net with N-Beats Kernels

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Quant PE

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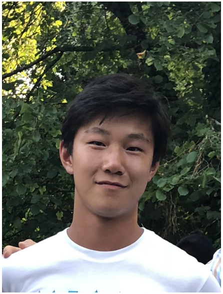
Team Members

We are a team based in Paris and Madrid, focusing on topics such as Time Series Machine Learning, Artificial Intelligence, Applied Mathematics, as well as applications in cryptocurrency and financial markets.



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Master in Applied Mathematics

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Cryptocurrency Market Forecast Background (1/2)

Global Economic and Policy Context

- **Trump's Stance on Cryptocurrencies:** Donald Trump, the first U.S. presidential candidate to openly support cryptocurrencies, views them as tools to counter traditional financial systems and central bank policies. This support could drive demand for digital assets.
- **Impact on Foreign Currency Trade:** Protectionist policies under Trump, such as setting barriers to foreign currency trade, may reduce arbitrage opportunities in traditional forex markets. In response, investors might hedge assets or turn to cryptocurrencies for potential returns.

Cryptocurrency Market Forecast Background (2/2)

Market Activity and Arbitrage Opportunities

- **Policies Driving Market Volatility:** Uncertainty in political policies increases market volatility, creating more opportunities for arbitrage and trend-following strategies.
- **The Global Nature of Cryptocurrencies:** Operating beyond national monetary policies, cryptocurrencies are critical tools for investors to hedge risks. Our forecasting model leverages this increased market activity to identify trading opportunities and optimize returns.

Model Overview

- **Kernel U-Net:** A U-shaped architecture ideal for time series forecasting.
- **N-Beats Kernels:** Specialized for long-term trend and seasonal pattern decomposition.
- **Output:** Candle chart prediction for future time windows.

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Kernel-U-Net: Multivariate Time Series Forecasting using Custom Kernels

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I. Introduction

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N-BEATS: Neural basis expansion analysis for interpretable time series forecasting

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Abstract

1 Introduction

1

Key Advantages: Model

- **Model Advantages:**
  - **Scalability:** Efficiently handles large and complex time series datasets.
  - **Precision:** Captures intricate patterns in cryptocurrency price movements.
  - **Customizability:** Flexible architecture allows integration of advanced kernels like N-Beats.
  - **Efficiency:** Linear computational complexity ensures fast processing.

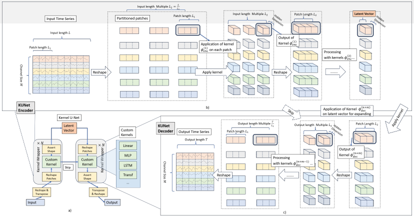

Figure: *Kernel U-Net Structure*

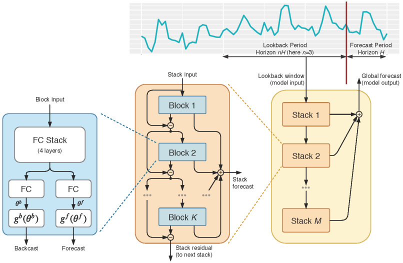

Figure: *N-Beats Forecasting Diagram*

Key Advantages: Team and Vision

- **Team and Vision:**
  - **Innovation-Driven:** Inspired by the groundbreaking work of Renaissance Technologies, founded by Jim Simons.
  - **Collaborative Environment:** Building a company where talented individuals can thrive, innovate, and contribute to shaping the future of financial technology.
  - **Entrepreneurial Spirit:** Laying the foundation for a highly profitable company in the cryptocurrency forecasting space.
  - **Join Us:** We invite like-minded individuals to collaborate and grow with us as we redefine financial prediction and market analysis.

Figure: *

Our inspiration for innovation and excellence.

Key Advantages: Surpassing Traditional Models

Limitations of Traditional Models

- **Static Rules:** Rely on historical data with the assumption that past trends remain stable.
- **Lack of Nonlinear Capability:** Unable to process complex market behaviors effectively.
- **Slow Response to Sudden Events:** Struggles to adapt to black swan events or policy changes.

Kernel U-Net with N-Beats Solutions

- Adapts dynamically to market changes and supports real-time data updates.
- Enhances the ability to predict future trends instead of merely fitting past data.
- Efficiently handles high-dimensional complex data, including sentiment analysis and blockchain activity.

Market Prospect

- **Cryptocurrency Industry:** Valued at over 2 trillion dollars and growing.
- **Demand:** Reliable prediction models are critical for institutional and retail investors.
- **Commercialization:**
  - **Potential Clients:** Hedge funds, cryptocurrency exchanges, portfolio managers.
  - **Applications:** Price forecasting, risk management, automated trading.
- **Revenue Model:** Licensing, subscription-based analytics platforms.

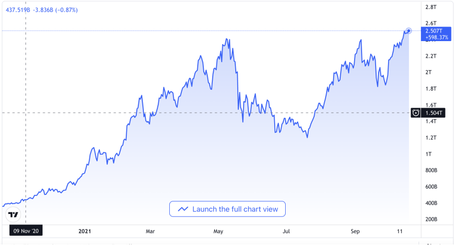

Figure: Crypto market cap breaks $2.5T

Model Performance

- Exceeds existing benchmarks in precision for multivariate time series datasets.
- Demonstrated significant memory and computation time savings.
- Outputs clear and actionable predictions in real-time.

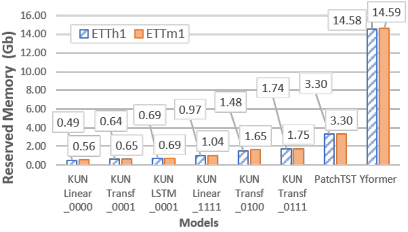

***Figure 1:** Reserved Memory Comparison

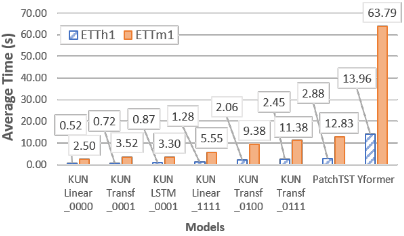

***Figure 2:** Computation Time Comparison

Conclusion

- Kernel U-Net with N-Beats is a cutting-edge model for cryptocurrency market forecasting.
- Combines precision, efficiency, and scalability.
- Offers substantial commercialization opportunities in a rapidly growing market.
- Ready for deployment in real-world trading and analytics platforms.

The End

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