Modern Enhancements to the Trade-That Engine

A Reinforcement Learning Agent Voting for a Transformer-based Multi-Classification Model

**Graduate**

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Introduction: Cryptocurrencies are known for their high volatility, and investors aim to capitalize on this. Manual trading can be emotionally driven and risky. To minimize risk, rule-based strategies and automated approaches are employed.

Approach / Technology: This thesis focuses on enhancing the "Trade-That engine" for cryptocurrency trading, which consists of multiple classification models combined through an optimized soft voting technique, by integrating state-of-the-art concepts. A novel classification model, called the "Novel classifier", based on the Transformer architecture, is introduced to learn directly from raw candle data. Feature encoding techniques, normalization, and a novel time frame stacking technique are used for data preprocessing. The "Novel classifier" is compared to the original "Trade-That classifiers" using the generated labels by the triple barrier method. A Reinforcement Learning-based approach called the "RL Agent" is proposed to dynamically vote for the classifiers based on market situations.

Conclusion: The improved engine, incorporating the "Novel classifier" and "RL Agent", outperforms previous versions in backtesting, demonstrating better return performance and risk assessment metrics across different market situations. Developing a trading engine is challenging, and various approaches were developed until a successful setup was found. Nonetheless, integrating advanced neural models and Reinforcement Learning has led to remarkable outcomes. One promising avenue for future research involves enhancing the trading strategy by incorporating multiple assets to create a diversified portfolio, thereby reduce risk through the spreading of potential losses across various assets and market sectors.

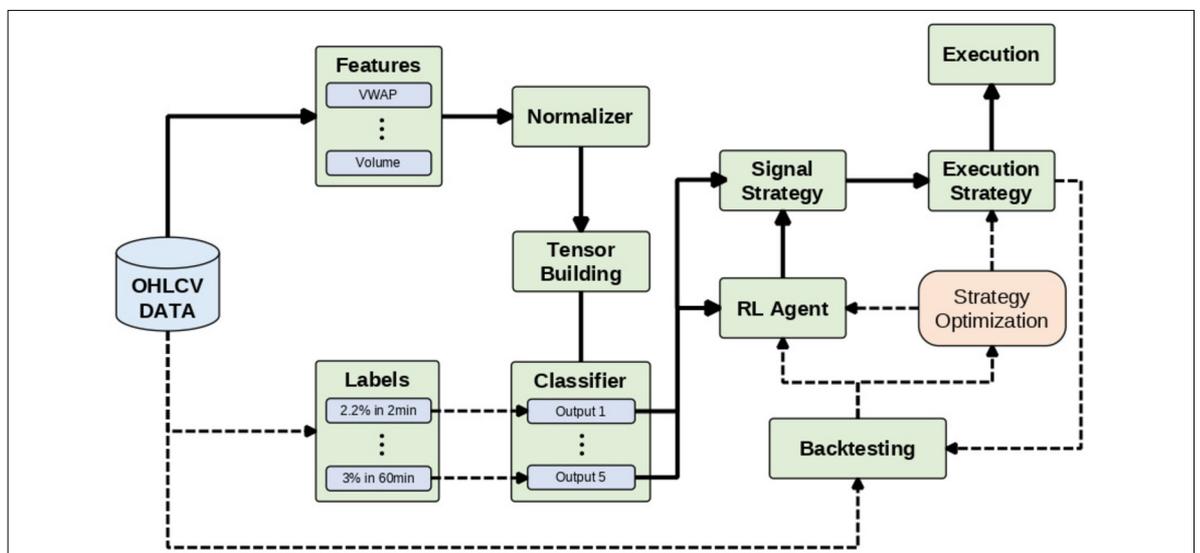**Daily average predictions of the "Novel classifier" on the "post study" test dataset**
Own presentment
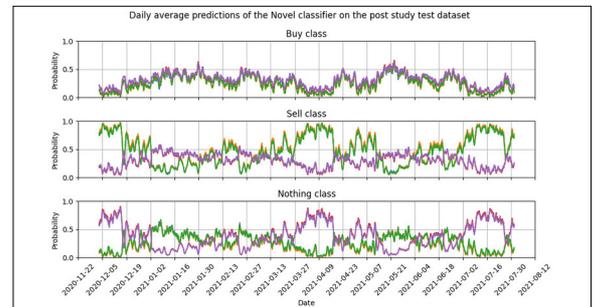
Backtesting results of the "RL Agent" on the "post study" test dataset
Own presentment
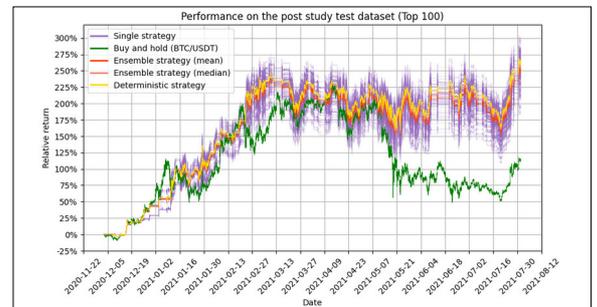
Schematic representation of the "RL Agent"
Own presentment

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Subject Area
Data Science

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