NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Computer Science and Engineering
College of Engineering

Interpretable Fuzzy Transformer-based Network (IFTN)

with Applications in Portfolio Rebalancing

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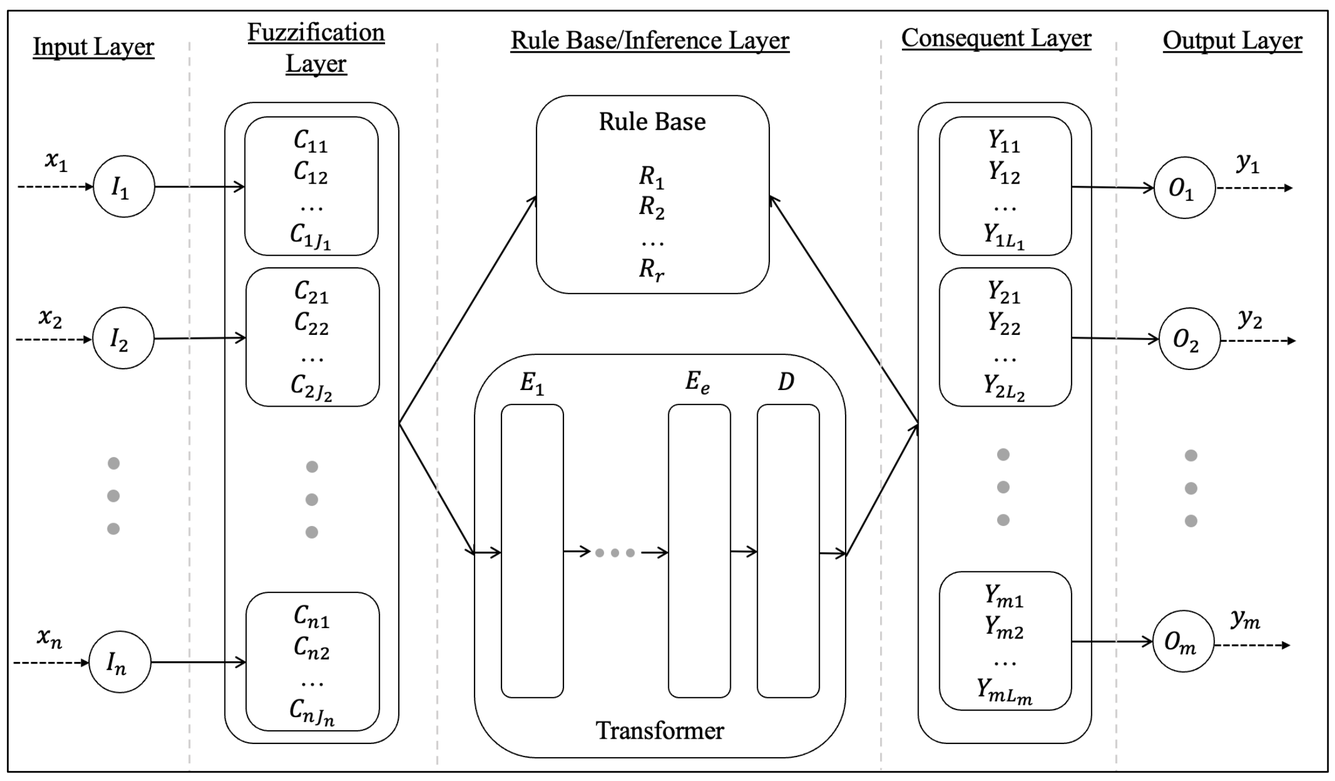
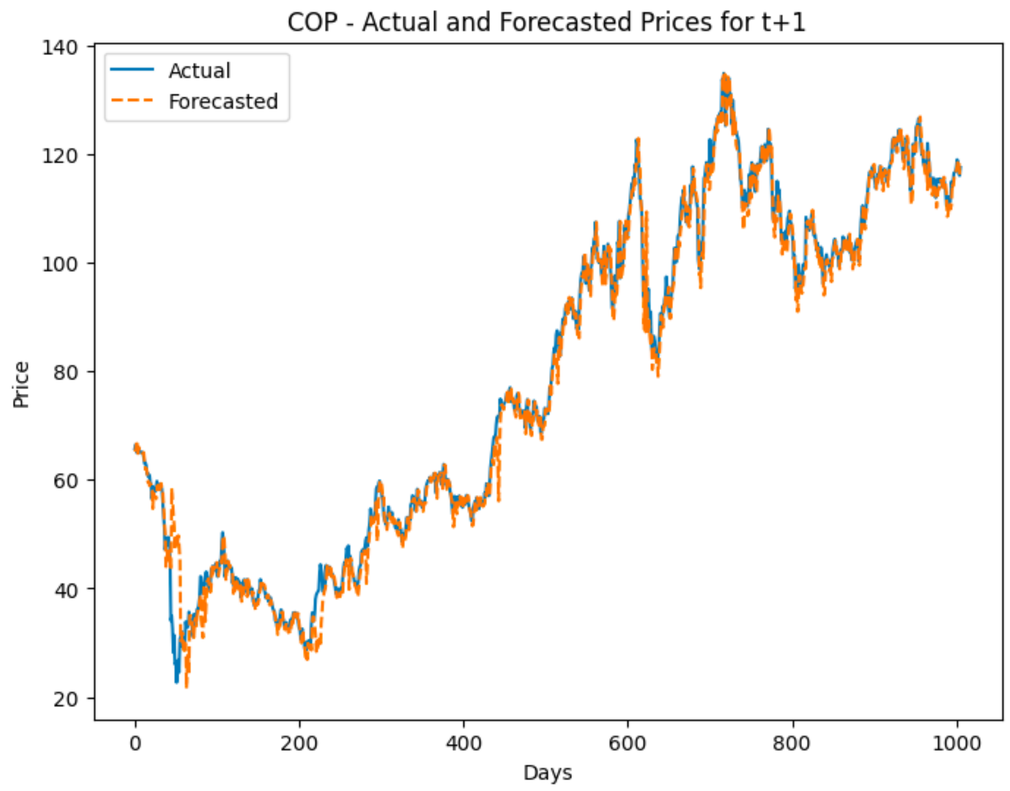
Project Objectives

This project proposed the **Interpretable Fuzzy Transformer-based Network (IFTN) model** that combines the **interpretability** of a fuzzy inference system with the **forecasting ability** of a transformer-based network model. The proposed IFTN model can be utilised to perform portfolio rebalancing, with the objectives of penalising underperforming markets and capitalising on well-performing markets. A **two-component portfolio reallocation strategy** is proposed, and the reallocation process is facilitated by reinforcement learning models.

IFTN Architecture

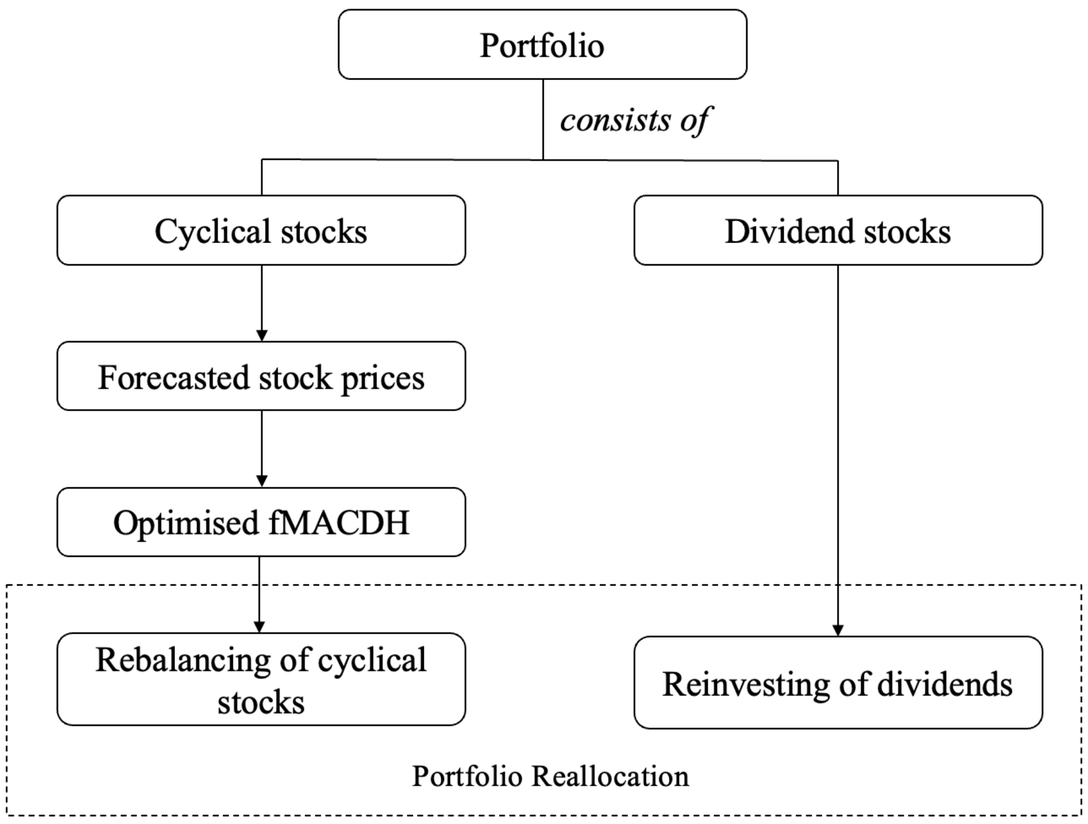


Forecasting Result

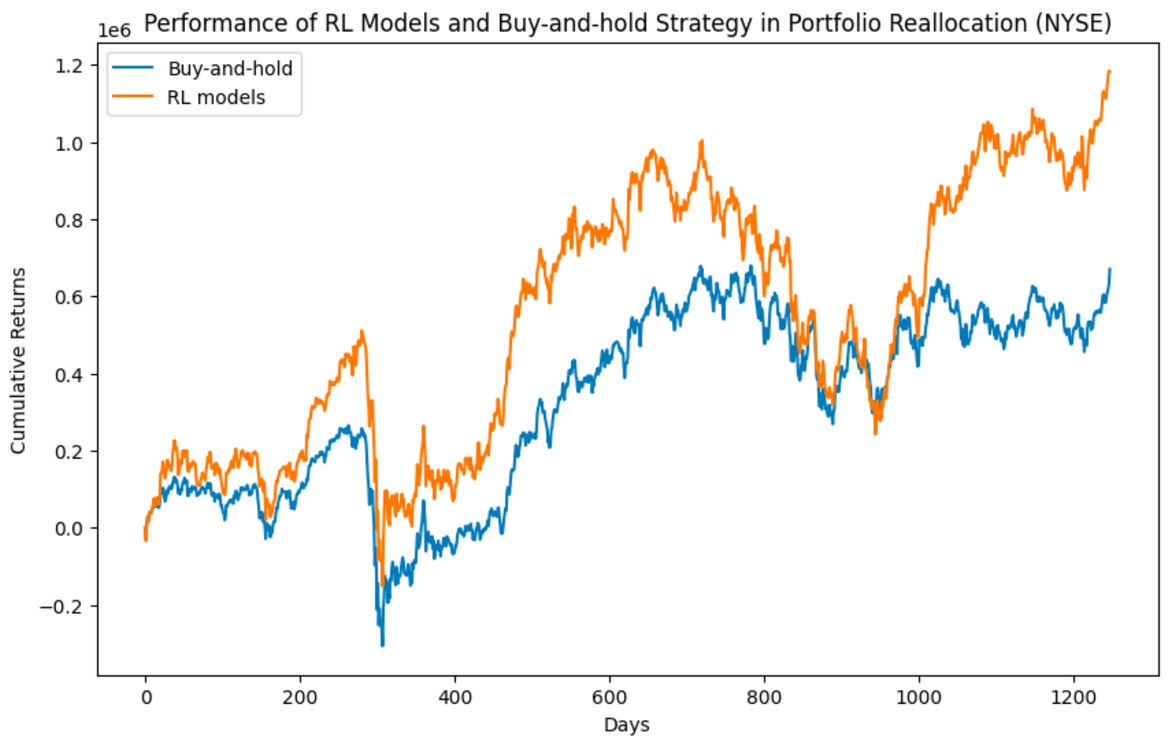


The IFTN model is capable of forecasting stock prices for up to 13 days in the future.

Portfolio Reallocation Strategy



Portfolio Reallocation Result



The proposed strategy outperforms traditional buy-and-hold strategy.