Learning-based Technical Indicators

Project Proposal

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Objectives

Technical analysis is a methodology to evaluate securities and forecast future price movements based on historical price data and market statistics. It involves analysing charts of price movements, trading volume, and other market-related data to identify patterns and trends that may help predict future price movements.
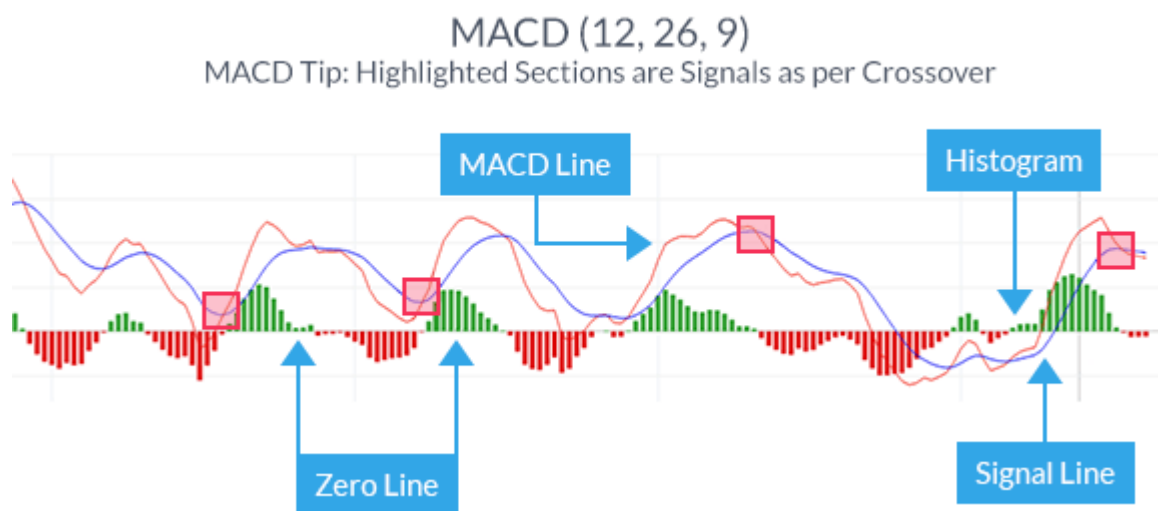

Figure 1: Classical handcrafted indicators used for technical analysis (source: https://www.dailyfx.com/)

Tradition technical analysis method rely on handcrafted rules and metrics that are typically referred to as indicators. While several authors advocate the use of these indicators as good investment signals, their human-based nature suggests that more complex indicators could be obtained using a learning-based approach. As such, this project envisages the development of learning-based indicators and their evaluation as investment signals. In particular, recurrent neural networks will be exploited to learn the stock price given a set of historical observations, as well as, to devise a buy/sell score estimator, representing a novel learning-based indicator for providing trading signals.

Tasks

T1: Study the state-of-the-art on the topic of technical indicators and understand the functioning of general deep learning approaches. (0.5 months)

T2: Acquisition of a dataset comprising the historical prices from several stocks (2 months).

T3: Benchmarking of traditional technical indicators in the dataset collected. (1 month).

T3: Development and assessment of learning-based technical indicators. (1 month).

T4: Tests and debugging (0.5 months).

T5: Report writing (0.5 months).

Academic Prerequisites

- Interest in the field of Artificial Intelligence and Computer Vision.
- Proficient in Python or with an interest in learning.

Expected Results

- Dataset
- Computational Prototype
- Project Report