

Stock Market forecasting analysis using different probabilistic and machine learning Models

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Abstract:

Stock Market analysis is a challenging field due to the high uncertainty of the future information. The market depends on two different features that are fundamental and technical. Fundamental features are the macroeconomic analysis as the industry analysis, company analysis as the financial data and performance data. The technical analysis is the stock indexes as the stock movement, unemployment rate, consumer price index and implied volatility index.

In that project we are going to implement the historical data of all these indexes with the DOW stock index which consists of 30 large companies listed on stock exchange in the United states. We are going to implement various probabilistic models as Bayesian, Hidden Markov Model and Markov Chain Monte Carlo. All these models are based on information measurements as the entropy, relative entropy, and mutual information. These measurements will indicate the buy and sell positions in the stock. The difference between this proposed approach and models used in previous studies is the usage of fundamental analysis as a real time feature. We will also compare these probabilistic models with other machine learning models based on time series as Arima, MA and SVR. We will compare the overall gain percentage over a period of time and compare it with a normal trader that bought the stocks and hold.

My role in the project:

- data sampling and preprocessing for the features and observations we plan to feed the proposed models.
- NLP approach to determine news trends.
- Setup different investing portfolios (long hold, short hold, HMM, BM) depending on variant number of features.
- Front-End graphical user interface for different investing portfolios.

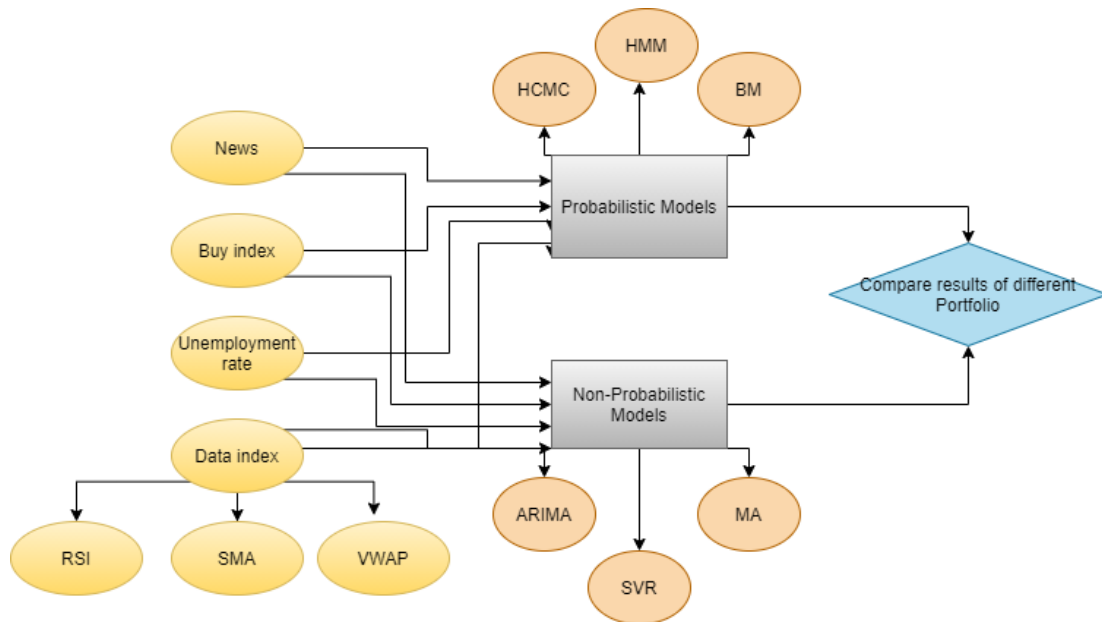


Figure 1 project flow diagram