Artificial Intelligence Stock Market Predictions

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Challenges in Stock Market Predictions

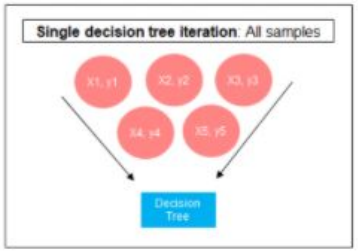
The prediction process of stock values is always a challenging problem.

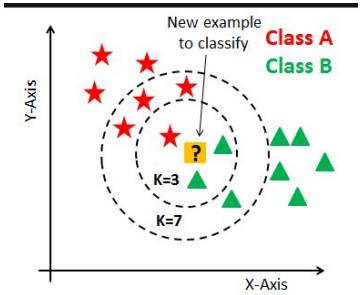
The dated market believed that it is impossible to predict stocks values.

- There are many economic factors can influence the price of stock
- There are also many technical parameters to obtain statistical data from value of stocks price
- The nature of stock value is ambiguous, and the stock value is dynamic, non-parametric and non linear which make statistical models perform weakly.

The disadvantage of traditional methods

Even though The traditional machining learning method has good performance in statistic area, it can not have a good accuracy score to predict stocks trent, such as, linear regression, decision tree, support vector machine, knn and so on.





AI Provides a Solution to Stock Market Predictions

- AI and ML technologies can evaluate the factors that are “hidden” by using neural networks and other learning methods.
- AI can help analysis huge amount of data which is nearly impossible to do with normal statistical tools
- The analysis with AI or ML technologies with huge amount of data can be much more efficient and faster than other methods

How could AI actually help those problems

- In the previous page, by “hidden”, we mean the massive parameters that might impact the stock market but people would ignore or too much to consider

There are some other things AI and ML can do in stock market:

AI can tackle the problem like frauds, false positives and so on.

AI can work very fast so it can work in high frequency which is extremely important in stock market

Algorithms and Technologies for Stock Market Prediction

Tyler Quinn

With a focus on:

- Markov Models
- Artificial Neural Networks
- Deep Learning Long Short Term Memory (LSTM)

Markov Modeling

- Time proven AI method, reimagined for stock market predictions
- Rather straightforward and easy to understand
- Room for improvement of modeling when combined with other methods

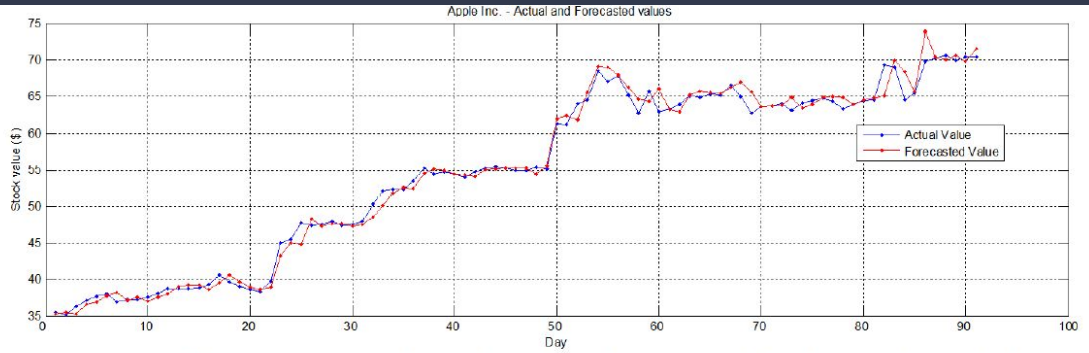


Fig. 1. Actual Value v/s Forecasted Value for Apple Inc. from 13 September 2004 to 21 January 2005.

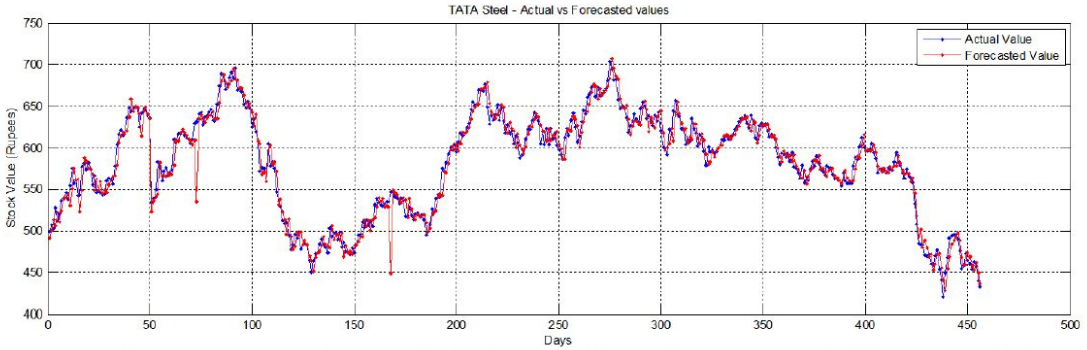
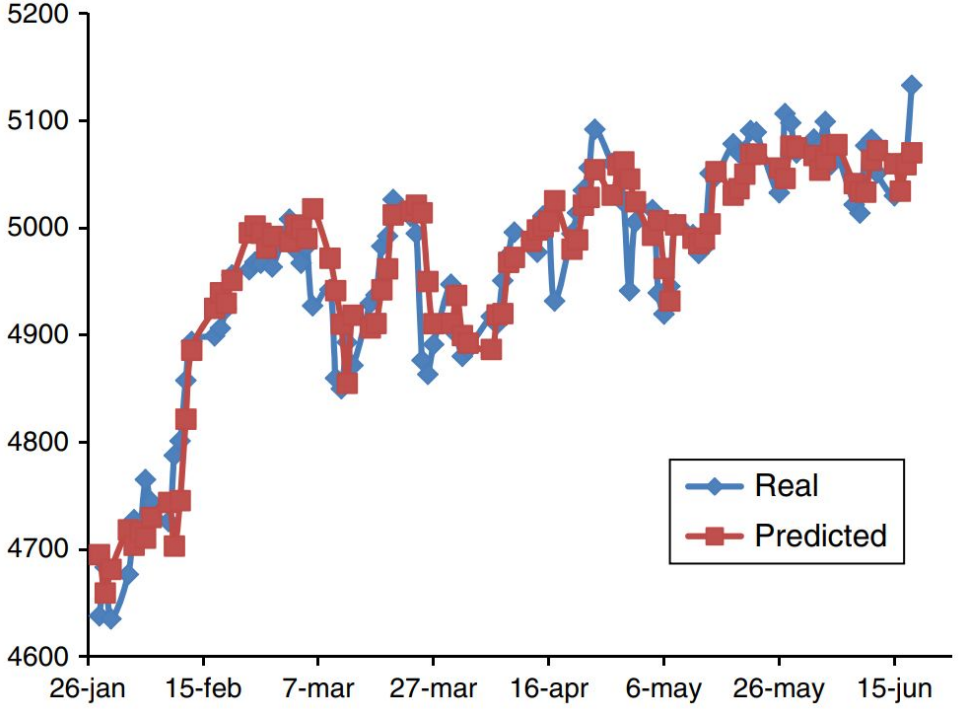


Fig. 2. Actual Value v/s Forecasted Value for Tata Steel from 5 November 2009 to 23 September 2011.

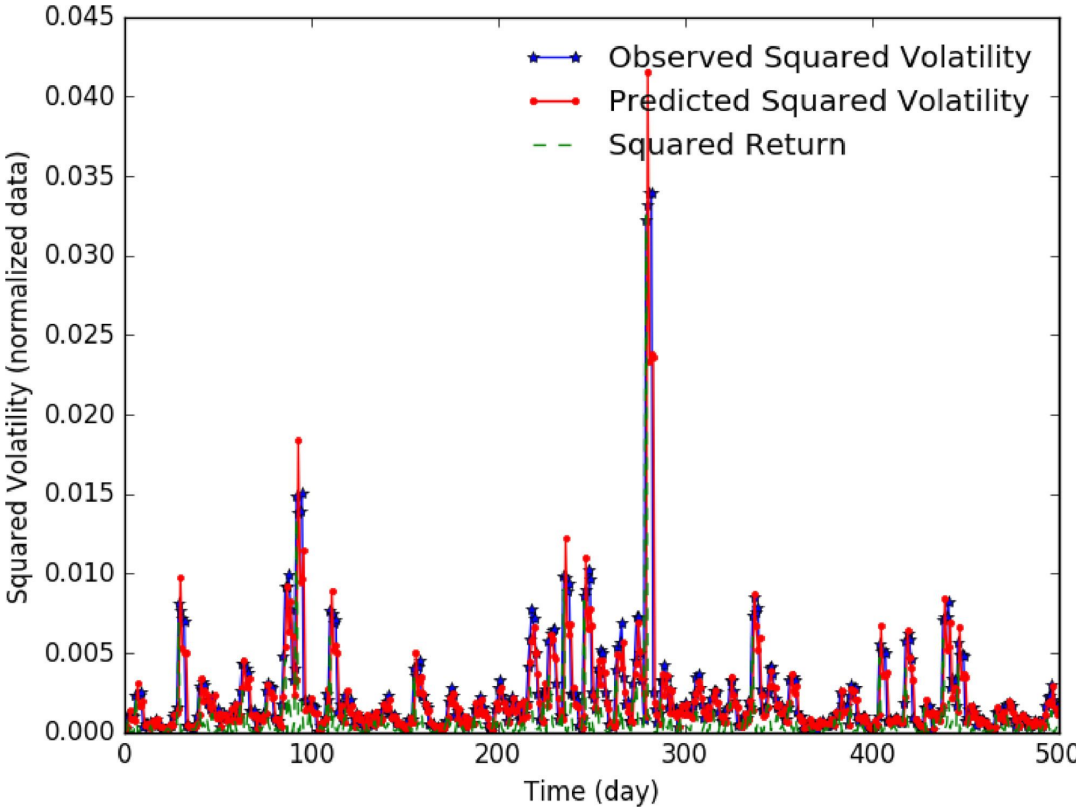
Neural Networks

- Many different techniques, mainly some form of Artificial Neural Network
- One of the more accurate raw methods
- Often combined with other algorithms



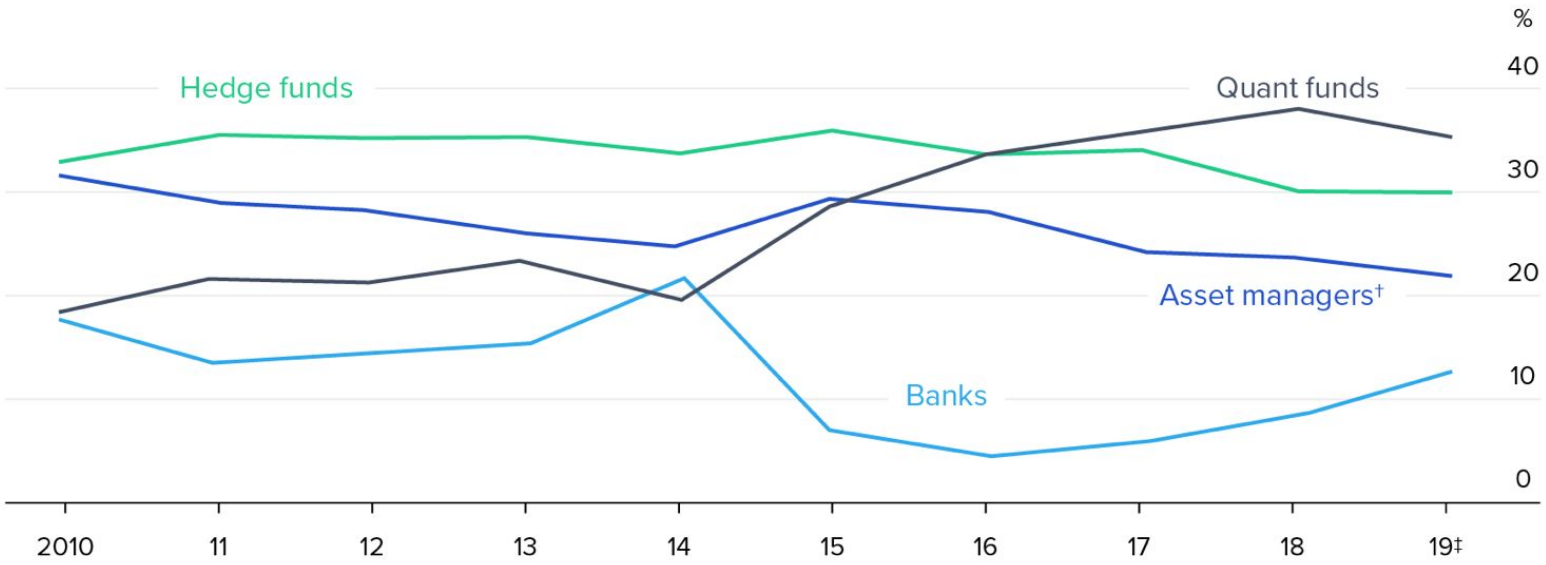
Deep Learning Long Short Term Memory (LSTM)

- Combines and builds on other models
- Very robust process on data selection
- One of the most accurate methods for stock market prediction



Results of AI Stock Market Predictions

- AI models and algorithms are deeply integrated into the Financial Sector.
- Robotic traders manage about $1 out of every $3
- Majority of the Stocks that are traded today are algorithmically picked.
- Financial Institutes use high-frequency trading (HFT) algorithmic funds to gain competitive advantage



*Excluding retail and high-frequency trading firms
†Institutions including pension funds, mutual funds and other money managers
‡Estimate

Source: TABB Group, via The Economist

US share of institutional trading by volume of shares.

TOP QUANTITATIVE HEDGE FUNDS

- DE SHAW
- QUANTITATIVE MANAGEMENT ASSOCIATES
- TWO SIGMA
- RENAISSANCE TECHNOLOGY

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