Graduate Student Showcase

A New Stock Price Prediction Method Using Covariance Information

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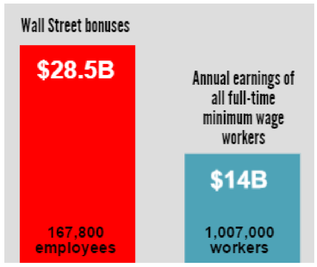
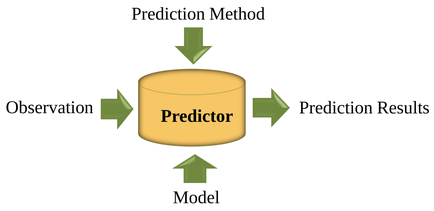
1) Who Wants to Make MONEY?!

- There are a total of 60 stock exchanges in the world with a total market capitalization of $69 trillion.



2) Let's Make Some MONEY!

- The successful forecasting of potential stock prices can provide significant profit.



3) Challenges Involved

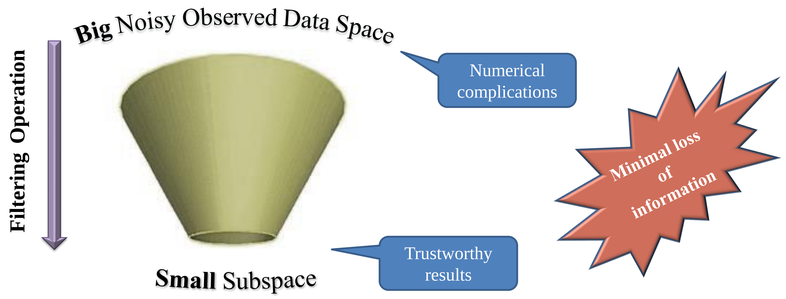
- Most prediction methods suggested in literature are very complicated or heuristically designed for a specific setting. Moreover, some common prediction methods are not well-conditioned when dealing with big datasets.
- Most multi-predictor algorithms in literature use data that is not available to public for free.

Solution?!

- We propose a new method in order to improve the condition number of the problem.
- The input data to our algorithm is publically available from yahoo.finance.com and similar resources.

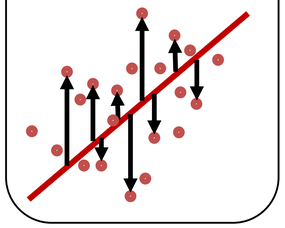
4) Proposed Method

- Principal component analysis is a well-established mathematical procedure for dimensionality reduction of the data.
- Projecting the noisy observed data onto a principle subspace improves the reliability of prediction results.



5) Performance Metrics

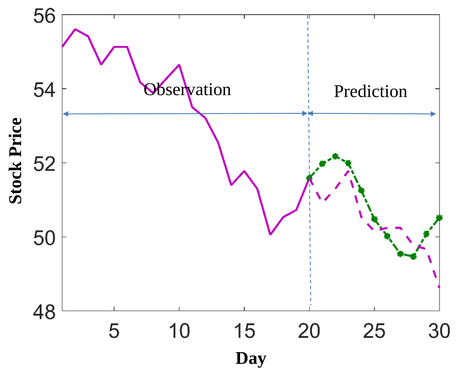
- Mean Squared Error



- Direction of Price Movement

- Volatility

6) Some Results



- The proposed method reduces the dimensionality of the problem which improves the condition number.
- Very good performance was achieved in terms of MSE and Volatility.

- Our method has outstanding performance in terms of predicting the direction of price movement.

7) Conclusions

- The proposed method shows very promising performance compared to similar methods in literature.
- Our method is easily implemented and can be modified to include additional predictors.

8) Ongoing Research

- Incorporating our method into trading strategies
- Using the proposed algorithm in other fields and applications

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