

# Pattern Recognition

Comp 6731

Fall 2019

## Forecasting Stock Prices with SVMs Regression

**Problem:** Forecasting stock price is one of the fascinating issues of stock market research. Accurately forecasting stock price is probably the biggest challenge due to its volatile in nature. Many algorithms were used to predict the stock price few such techniques are time series forecasting and neural networks. The objective of our project is use Support Vector Machine regression algorithm and examine the feasibility of Support Vector Machine in predicting the stock price and calculating the error values, comparison between actual and predicted prices.

**Description:** Stock forecasts have been very useful in the past and are being used currently by the investors for looking out the superior investment opportunities. Studies have shown that the Univariate time series are as accurate as linear regression or vector auto-regressive models, one of them is neural networks. Neural networks are noise tolerant and predict market prices not just by prices and volumes history alone. It maps any non-linear function without a priori assumptions about the properties of data, can learn complex systems with incomplete and corrupted data. Neural networks algorithm, support vector machines (SVM) is used to implement the structural risk minimization principle which minimizes the upper bound of generalization error than training error. Based on this, SVM's achieve the right balance between empirical error and vapnik-chervonenkis dimension confidence interval. With the introduction of vapnik insensitive loss function, SVM's solves the non-linear regression estimation problems.

**Results Format:** predicted stock price, metrics such as normalized mean square error(NMSE), mean absolute error(MAE), directional symmetry(DS)

**Visualization:** graphs (SVM vs Actual Price)

**Programming Language:** python (standard libraries)

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## References

[1] Yukun Bao, Yansheng Lu, Jinlong Zhang. Forecasting Stock Prices by SVMs Regression. Springer-Verlag Berlin Heidelberg (2004).