**CS 205 FINAL PROJECT PROPOSAL**

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**Summary**

Despite the availability of high-frequency stock market data, its use in forecasting stock prices is studied to a lesser extent. Similarly, despite the recent success of neural network on as a forecasting method, its power in forecasting high-frequency dynamics has been relatively overlooked. A possible explanation is the intractable computational intensity of training neural network on the massive volume of high-frequency data. This motivates our study on applying parallelism to the training task and evaluate its performance to demonstrate weak and strong scaling.

**Methodology**

We formulate the task as a prediction problem, using lagged previous prices of individual stocks to predict future prices at the minute level. The high-frequency consolidated trade data for the US equity market comes from NYSE Trade and Quote (TAQ) database, available by the WRDS research center.

For the prediction method, multi-layer Artificial Neural Networks (ANN) using backpropagation algorithm has shown promising results in stock index prices compared with traditional methods [4]. Note that the gradient descent update in the backpropagation algorithm is sequential by nature. We will apply XYZ techniques to parallelize this program.

**References**

[1]

[2]

[3]

[4] Selmi, N., Chaabene, S., & Hachicha, N. (2015). Forecasting returns on a stock market using Artificial Neural Networks and GARCH family models: Evidence of stock market S&P 500. Decision Science Letters,4(2), 203-210. doi:10.5267/j.dsl.2014.12.002