

MSDS 7330-402 Project Proposal

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I. Title

Beating the Odds: Using Twitter to Profit from
FOREX

II. Team

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III. Problem Statement

The hardest part of FOREX trading is consistently making a profit. Even small profits can be hard to make after taking the spread into account and the vast majority of personal FOREX traders do not profit at all. Our goal is to implement a system that will import FOREX tick and Twitter social media data. These data will be analyzed to make trades based on predetermined rules and test the rules for profit or loss. The trading rules will be tested against two benchmarks, a buy and hold strategy as well as a random buying and selling strategy. The primary goal will be to do better than the benchmarks. The secondary goal will be to make a profit.

IV. Research Methodology

- a. The first requirement will be to use a service to obtain real-time foreign currency exchange rates and Twitter feeds. The FOREX and Twitter APIs will be used to accomplish this.
- b. Next, the data will need to be stored for analysis and testing. MongoDB will be the primary database as it is appropriate for storing time series data. SQL Server will be a backup database since the team has previous experience implementing and using it.
- c. A total of 4 trading strategies will be implemented and tested:
 - i. **Buy and Hold** – This strategy will involve simply buying a currency pair at the beginning of the trading period (TBD) and selling at the end. Since buy and hold is a more traditional investment strategy it will serve to compare our trading rules with what other investors currently do.
 - ii. **Simple Moving Average** – This strategy calculates a moving average over a specified timeframe. Buy/sell trades are conducted depending on whether the real-time bid/ask price is above or below the moving average.

- iii. **Twitter Analysis** – Trades will be weighted based on how many times a currency or currency pair is mentioned (volume) on Twitter within a given timespan. The weight values will be applied to the simple moving average to predict how the price will continue to move.
- iv. **Random** – This strategy will involve randomly buying and selling a currency pair. This will act as a control to determine the success of actual planned and analyzed trades.
- d. Hypothesis testing will be conducted to determine how the 4 strategies compare to one another and if they perform better than blind luck (the Random Strategy)

V. Previous Work

Twitter is an avenue for millions of people to express their thoughts, feelings, or simply what is happening around them. As such it represents a mine of information for the things happening in society and how those events affect it. Researchers have leveraged this new resource to make quickly reacting predictions of greater social trends. A well-publicized example is the ability to track the spread of the flu in real time and predict where an outbreak will occur. Twitter data has also been used on less concrete events as well. The volume of Tweets about a given Presidential candidate can correlate very strongly with their polling numbers. One group of researchers found that analyzing the actual sentiment of the Tweets was no more effective than simply looking at the volume. Given that we will only be taking volume into account. However the researchers also found some candidates had better correlation of Tweet volume to poll numbers than others. They concluded their model needed more components to strengthen the analysis. In our case that extra component will be weighting the Tweet volume with the moving average

- a. P.J. Kaufman, *Trading Systems and Methods*, Hoboken, NJ: John Wiley & Sons, Inc.
- b. D. Aronson, *Evidence-Based Technical Analysis*, Hoboken, NJ: John Wiley & Sons, Inc.
- c. C.D. Kirkpatrick II and J.R. Dahlquist, *Technical Analysis* (The Complete Resource for Financial Market Technicians). Upper Saddle River, NJ: FT Press
- d. Opera Solutions, 'Predicting US Primary Elections with Twitter', NIPS 2012 Workshop, 2012.
- e. H. Achrekar, A. Gandhe, R. Lazarus, Ssu-Hsin Yu and B. Liu, 'Predicting Flu Trends using Twitter data', 2011 IEEE Conference on Computer

Communications Workshops (INFOCOM WKSHPS),
2011.

VI. Research Plan

- a. *Implement a program to pull ticker data using an API*
October 12, 2015
- b. *Implement a program to pull Twitter data using an API*
October 12, 2015
- c. *Implement a database to store the ticker data*
October 19, 2015
- d. *Set up analysis and implement trading rules*
October 26, 2015
- e. *Analyze results*
November 2, 2015
- f. *Write up results*
November 9, 2015

VII. Resources

- a. *FOREX Ticker Service*
<http://www.forex.com/forex-api.html>
- b. *Twitter Data Service*
<https://dev.twitter.com/streaming/overview>
- c. *Database*
Primary – MongoDB
Secondary – SQL Server