Machine Learning Project Proposal

Sentiment Analysis of Social Media For Stock Market Prediction

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- **Introduction:** Our project focuses on predicting future stock changes using the attitude of social media posts (specifically Twitter). Actually, social media react to changes in stock market but sometimes they can also influence it. We hope to find a correlation between a positive or negative media presence to the corresponding changes in stock values.
- **Methods:**
  First, we will extract the sentiments from the tweets thanks to the python library VaderSentiment. We chose this library because it has been specially developed to analyze sentiments expressed in social media.
  Create training, validation, and test sets by associating twitter sentiment data with the appropriate stock information
  Train model based on sentiment analysis of past tweets and stock market evolution during the same period.
  Finally, we will test our model by comparing our predictions of the stock market to the real stock market values.
- **Dataset:**
  Twitter Historical Data, S&P 500 Historical Data, Dow Jones Historical Data
- **Potential Results:**
  Determining variance in stock market that can be attributed to sentiment
- **Discussion:** At this point, we have already created a proof of concept in pulling posts from Twitter and applying the python sentiment analysis package. In addition, we have gathered stock data allowing us to view opening and closing values, etc. over several various intradaily periods as well as daily as far back as 1998.
- **Referenced Papers:**
  J. Bollen and H. Mao. *Twitter mood as a stock market predictor*. IEEE Computer, 44(10):91–94.

  Carolyn Campbell, et al. *Predicting Volatility in Equity Markets Using Macroeconomic News*. CS 229 Final Project, cs229.stanford.edu/proj2015/202_report.pdf.

  Shynkevich, Yauheniya & Mcginnity, T.M. & Coleman, Sonya & Belatreche, Ammar. (2015). *Predicting Stock Price Movements Based on Different Categories of News Articles*. 10.1109/SSCI.2015.107.

  Alexander Porshnev, et al. *Machine Learning in Prediction of Stock Market Indicators Based on Historical Data and Data from Twitter Sentiment Analysis*. 2013 IEEE 13th International Conference on Data Mining Workshops.