Predicting Next Day Stock Returns After Earnings Reports Using Deep Learning in Sentiment Analysis

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STAT 157 - Introduction to Deep Learning

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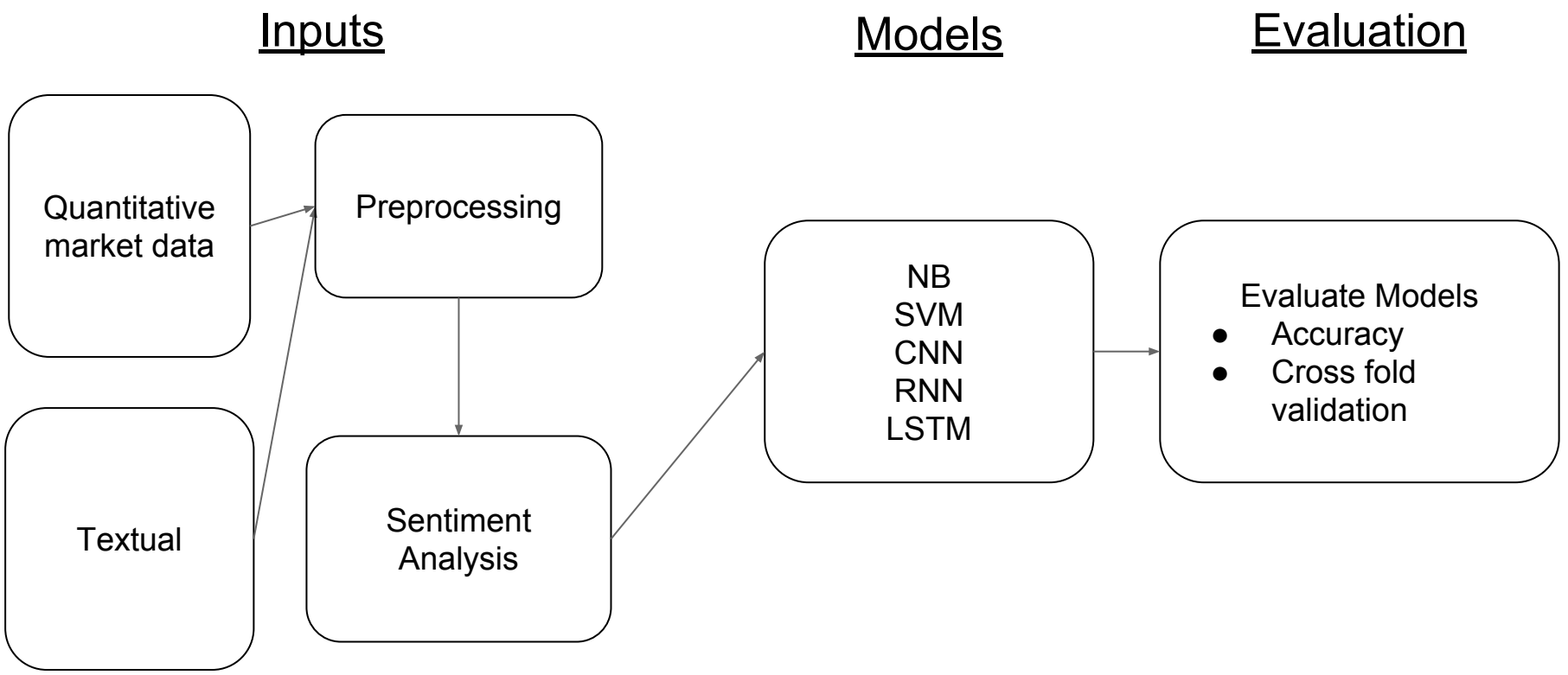
Overview

Determine the best deep learning architecture for predicting market dynamics surrounding quarterly earnings reports



Data Sources

Quantitative market data for S&P 500 stocks

- Investors Exchange (IEX) API
  - Stock price history (OHLC)
  - Trading volume
  - Earnings results, performance vs. consensus expectations

Market sentiment data

- Social Media APIs
  - Reddit: r/stockmarket, r/stocks, r/wallstreetbets, r/investing, etc.
  - Twitter: filter for messages including stock tickers in S&P 500
- Reuters API - United States business news
  - Filter for articles including S&P 500 stocks

Relevant Literature

Paper	Strengths	Weaknesses	Relevance
"Predicting Stock Price Changes with Earnings Call Transcripts" - Liang	Well-developed preprocessing methodology Compute sentiment based off of price changes	Only considered earnings call transcripts Did not use neural networks	Basing our preprocessing method off of theirs allows us to focus more on model fitting
"Deep Learning for Sentiment Analysis: A Survey" -- Zhang et al.	Comprehensive review of deep learning models	No financial analysis	Use this overview of models to determine which models we should fit
"Aspect-based Financial Sentiment Analysis with Deep Neural Networks" -- E et al.	Determine effect of aspect-based sentiment analysis on an LSTM neural net (ALA)	Only news headlines and microblogs	ALA performed better than CNNs and RNNs, but by adding quantitative data we may find a different result