

## **Thesis:** Apply Deep Learning On Financial Sentiment Analysis

**Abstract:** Portfolio Investment has always been appealing to investors and researchers. In the past, people tend to use historical trading information of the securities to predict the return or manage the portfolio. Nowadays, the literature have been proved that the market sentiment could predict asset prices. Specifically, it has been shown that the stock market movement is related to financial news and social media events. Thus, it becomes necessary to extract the sentiment of the financial news.

We explicitly introduce the application of dictionary methods, traditional machine learning models and deep learning models on text classification. The experiment results show that the deep learning models, especially, the LSTM model performs best on text classification. Furthermore, we investigate the embedding layer of the LSTM model and plot the important features on 2-D space with the t-SNE technique, it shows that the semantic similar features clustered together in the space.

Based on the sentiment of each stock, we build several daily rebalancing trading strategies by incorporating the sentiment extracted from the financial news articles. The trading strategies consider the majority votes, sentiment change and top author opinions, we compare all the trading strategies with market return, and evaluate each trading strategy from the long portfolio and short portfolio. Most of the existing methods only consider the historical stock information without adding the sentiment factor. Our contribution is to construct the trading model by incorporating the sentiment factor and the result shows that our trading strategies beat the market return and it is statistically significant.

### **Committee:**

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