**Abstract**

This study employs sentiment analysis and machine learning principles to explore the connection between "public sentiment" and "market sentiment." Its primary focus is to establish a connection between two key sentiments: "public sentiment" and "market sentiment." The study harnesses the vast landscape of Twitter data to predict the prevailing mood of the general public. This predicted mood, when combined with historical DJIA (Dow Jones Industrial Average) values, serves as a foundation for forecasting movements in the stock market.

To validate the effectiveness of our approach, we introduce a novel cross-validation methodology tailored specifically for financial data. This rigorous testing procedure demonstrates promising results, with our Self Organizing Fuzzy Neural Networks (SOFNN) model achieving an accuracy rate of 75.56%. This accomplishment is based on the analysis of Twitter feeds and DJIA values.

Furthermore, our study takes a practical step by implementing a simple portfolio management strategy guided by our predictive values. Notably, our research builds upon the pioneering work of Bollen et al., whose groundbreaking paper achieved an 87% accuracy in a similar predictive endeavour. By extending their findings and refining the methodology, we aim to contribute to the understanding of sentiment-driven market dynamics.

**Keywords:** sentiment analysis, machine learning, public sentiment, market sentiment, Twitter data, stock market movements, DJIA values, cross-validation, Self-Organizing Fuzzy Neural Networks (SOFNN), portfolio management, prediction accuracy,

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