Comparative Analysis of Classical Machine Learning and Deep Natural Language Processing Models for Financial Sentiment Analysis

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Abstract

This study presents a comparative implementation of classical machine learning (ML) and deep natural language processing (NLP) models for financial sentiment analysis using stock-related news headlines. The paper evaluated the predictive capabilities and computational trade-offs of traditional algorithms (Logistic Regression, SVM, Naive Bayes, Random Forest) against deep learning architectures (Dense NN, CNN, LSTM). Empirical findings revealed that while deep NLP models demonstrated superior contextual understanding, traditional ML models performed comparably with higher computational efficiency. The research concludes that hybrid or ensemble models could balance interpretability and performance, enhancing financial market forecasting systems.

Keywords

Financial Sentiment Analysis, Machine Learning, Deep Learning, NLP, Stock Prediction, Comparative Study, Artificial Intelligence.