Title : Tesla Stock Closing Price Forecasting Using Reddit Sentiment Analysis and LSTM Model

Author(s) : **1.** Rakchanok Wongsara **Student ID :** 650510677

Major : Computer Science

Advisor(s) : **1.** Associate Professor Dr. Chumphol Bunkhumpornpat

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ABSTRACT

This research investigates the effectiveness of incorporating social media sentiment with historical stock price data for forecasting Tesla's closing prices using Natural Language Processing (NLP) and Deep Learning techniques. Reddit comments were collected from the PushshiftDumps database and analyzed using the VADER model to generate daily sentiment scores, which were then integrated with Tesla stock price data from Yahoo Finance. A stacked Long Short-Term Memory (LSTM) model was employed using a lookback window and time-series data splitting to avoid data leakage. Performance was evaluated using multiple standard metrics and compared between the sentiment-enhanced model and the baseline model using only historical prices. Results show that the model incorporating sentiment consistently outperformed the baseline, indicating that social media sentiment can satisfactorily improve short-term stock price forecasting accuracy.

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