



PROJECT REPORT
COMPARISON OF CNN, LSTM, AND BI-LSTM
ALGORITHM IN TWITTER SOCIAL MEDIA
SENTIMENT ANALYSIS RELATED TO POLITICAL
ISSUES

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ABSTRACT

Still, analyzing the followers' sentiments of the tweeters or the tweets themselves in the social media such as Twitter, issues a key area of research particularly on political topics. Prior works have mainly concentrated on analyzing the performance of classical machine learning approaches, while little is done with regards to deep learning. This project addresses this gap by comparing three deep learning methods: Among them, the methods selected were Convolutional Neural Network (CNN), Long Short-Term Memory (LSTM), and Bidirectional Long Short-Term Memory (Bi-LSTM). For this experiment, we had a dataset from Kaggle consisting of politically related tweets. The procedure of data preparation included cleaning, tokenization, and feature extraction in the format of 'Term Frequency-Inverse Document Frequency (TF/IDF)'. Followed by segregating the entire dataset into model training and model testing sets, we trained all the classifiers individuality. The CNN model helps in capturing localized features in the text while, on the other hand, the LSTM model learns long term dependencies in the data. The Bi-LSTM model needed the bidirectional flow of information to boost the accuracy, of the model in respect to sentiment analysis. By evaluating the performance we have kept accuracy, precision, recall, as well as F1-score as our parameters. Pre-decided experiments give some hints regarding potential accuracy enhancements when using the Bi-LSTM model as compared to the CNN and the LSTM models. With that The present research is intended to establish a strong foundation for future sentiments analysis research and practical use in the political context.

Keywords: sentiment analysis, CNN, LSTM, Bi-LSTM, Twitter, political issue