
Geospatial Sentiment Analysis of Twitter User on Government Performance in Overcoming Floods in Jabodetabek Using IndoBERT and CNN-LSTM Method

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Abstract

Floods appear are common natural disasters that affect Indonesia, especially in the Jabodetabek area, and often trigger people to express their opinions and criticisms about the government's performance during flood events through social media platform such as Twitter . Among them, the handling of flood disasters in the Jabodetabek region is a highly discussed topic that causes widespread public reaction. This study aims to classify public sentiment toward government flood response using a hybrid deep learning model. A total of 3,894 Indonesian-language tweets were collected, preprocessed, and labeled. The sentiment classification process used IndoBERT as a semantic feature extractor and a CNN-LSTM architecture to capture both contextual and sequential patterns from the text. Evaluation was carried out using 10-fold cross-validation, with accuracy, precision, recall, and F1-score as performance metrics. IndoBERT achieved an accuracy of 91.76% and an F1-score of 90.66%, while the IndoBERT + CNN-LSTM model showed better performance with 94.92% accuracy and a 95.41% F1-score. To visualize the intensity of public discussions throughout Jabodetabek, geospatial mapping based on tweet location metadata was also carried out separately from sentiment classification using ArcGIS. The combination of semantic modeling and geospatial analysis offers an effective approach to understanding public sentiment in disaster-related contexts and supports better interpretation of regional public responses.

Keywords: CNN-LSTM, geospatial mapping, IndoBERT, sentiment analysis, social media, twitter (X).
