

Geo-Sentiment Analysis of Public Opinion of X Users towards the Documentary Film Dirty Vote using the Bidirectional Long Short-Term Memory Method

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Abstract

Presidential elections held every five years, often generates significant public discourse. The 2024 presidential election saw the release of the documentary Dirty Vote, which raised allegations of electoral fraud and sparked polarized opinions on social media, especially on X. This study aims to analyze public sentiment toward Dirty Vote using geo-sentiment analysis and the Bidirectional Long Short-Term Memory (Bi-LSTM) model. Data were collected from geotagged tweets, with sentiment classified as positive, negative, or neutral. The research explored various data processing techniques, including TF-IDF for feature extraction, FastText for feature expansion, and balancing methods like SMOTE and class weighting to address data imbalance. Results showed that the baseline Bi-LSTM model achieved an accuracy of 71.57% and an F1-Score of 74.05%. When enhanced with TF-IDF and FastText, accuracy increased to 77.07%, though the F1-Score dropped slightly to 72.95%. Applying SMOTE resulted in a decrease in accuracy to 76.45%, but significantly improved the F1-Score to 74.93%. Exploratory data analysis revealed that negative sentiment was most concentrated in Java Island, particularly Jakarta, and peaked during February 2024, coinciding with the documentary's release and the election period. This study significantly contributes to understanding how geographic locations influence public opinion on sensitive political issues. A lack of understanding of geographically-based sentiment patterns can hinder identifying regional needs, leading to poorly targeted policies. By integrating data analysis methods with geographical approaches, this research provides deep insights for designing more effective, data-driven public intervention strategies and supports policymaking that is more responsive to the dynamics of public opinion.

Keywords : *Bi-LSTM, Class Weight, Dirty Vote, FastText, Geo-sentiment analysis, SMOTE, TF-IDF*

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1. INTRODUCTION

Indonesia has adopted a democratic system since its independence in 1945. One of the key procedures in this democracy is the General Election (Pemilu), which holds significant meaning. The purpose of holding elections is to ensure that the transfer of power occurs safely and orderly, to uphold the sovereignty of the people, and to protect the human rights of every citizen [1], [2]. The presidential and vice-presidential elections are held every five years, making them a popular public event that is always widely discussed. Various perspectives emerge from different segments of society regarding the presidential and vice-presidential candidates. Amidst the festive atmosphere of this democratic celebration, the release of the documentary Dirty Vote on February 11, 2024, during the election's quiet period, was like a bomb exploding in the middle of the celebration. This film raises issues regarding alleged fraud in the 2024 Indonesian Presidential Election media Indonesia. The documentary's release sparked both support and opposition, generating diverse public opinions on social media, especially on