Analisis Sentimen di Media Sosial X Menggunakan Ekspansi Fitur FastText dengan Model Hybrid Klasifikasi CNN-BiGRU dan Optimasi PSO

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Abstract

The problem faced in this research is the low accuracy of sentiment analysis on Twitter data related to the 2024 Indonesian general election. Conventional approaches in feature extraction and model optimization have not been able to provide adequate results. To overcome this problem, this research proposes a hybrid CNN-BiGRU model optimized with Particle Swarm Optimization (PSO) and extended with FastText features. This research contributes by introducing a combination of advanced feature extraction techniques and optimization for sentiment analysis, which has not been widely applied in the context of elections. The methods used include CNN integration for local feature extraction, BiGRU for sequential data handling, and optimization using PSO. In addition, feature expansion was carried out using FastText with a combined corpus of tweets and news articles. The results showed that the CNN model achieved the highest accuracy of 83.59% without feature extraction, which increased to 84.11% with TF-IDF feature extraction. The FastText feature expansion significantly improves CNN performance with accuracy reaching 84.52%. The CNN-BiGRU hybrid model shows consistent improvements, especially when using FastText feature expansion. With PSO optimization, the CNN-BiGRU hybrid model achieved the highest accuracy of 84.76% at TOP 20 ranking.These results show that the integration of advanced feature extraction techniques and optimization significantly improves the accuracy of sentiment analysis. In conclusion, this research proves that the CNN-BiGRU hybrid model optimized with PSO and extended with FastText can significantly improve the accuracy of sentiment analysis on Twitter data related to general elections.

Keywords: 2024 Elections, Sentiment Analysis, Twitter (X), Hybrid CNN-BiGRU, FastText, Particle Swarm Optimization (PSO)