

SA-Bi-LSTM: Self Attention With Bi-Directional LSTM-Based Intelligent Model for Accurate Fake News Detection to Ensured Information Integrity on Social Media Platforms

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Publication Year 2024
Grant Number MSIU-RG23056
DOI link <https://doi.org/10.1109/ACCESS.2024.3382832>

Abstract: Detecting fake news is increasingly crucial in the digital age as social platforms and online news outlets amplify the spread of misinformation. This study proposes a novel approach for fake news detection using a Bi-LSTM neural network with an attention mechanism. The Bi-LSTM model's ability to discern long-range relationships and sequential patterns in text data is augmented by the attention mechanism, focusing on key segments within the text to enhance discriminative power. The dataset for training comprises a diverse collection of news articles, meticulously annotated by human fact-checkers to include both real and fake news samples. Pre-processing steps, including tokenization, are undertaken to optimize the model's learning capabilities. The proposed Self-Attention with Bi-Directionals-LSTM (SA-BiLSTM) model demonstrates promising performance in distinguishing real from fake news. The attention mechanism allows the model to highlight critical words and phrases, capturing essential features for accurate predictions. Evaluation through cross-validation reveals competitive results as opposed to cutting-edge fake news identification methods. Ablation studies emphasize the attention mechanism's significant contribution to identifying relevant textual patterns associated with fake news. The model, incorporating CNN, GRU, Attention-GRU, LSTM, and Bi-LSTM, surpasses contemporary procedures, as validated using the ISOT dataset. The results demonstrate a robust approach to fake news detection using Bi-LSTM with attention, contributing to the fight against misinformation. The proposed model SA-Bi LSTM obtained 99.98% predictive accuracy on test data. The accuracy of the proposed model (SA-BiLSTM) comparatively to baseline models is higher. The model shows potential for preserving information integrity on social media and news outlets, bolstering public trust in reliable sources.