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Optimized Deep Learning Techniques to Identify Rumors and Fake News in Online Social Networks

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[Zamani, Abu Sarwar](#)^{a,b}; [Hashim, Aisha Hassan Abdalla](#)^b; [Mohamed, Sara Saadeldeen Ibrahim](#)^a; [Alam, Nasre](#)^c

^a Department of Computer and Self Development, Prince Sattam bin Abdulaziz University, Saudi Arabia

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Abstract

The swift expansion of networking platforms has led to a significant proliferation of fake news on social media in recent years, posing a serious risk to public safety. This phenomenon carries various potential negative effects on society, including the erosion of public confidence in journalists and governmental institutions. Consequently, the identification of fake news has attracted considerable attention from

researchers across various fields. As online and social media platforms have grown, it has become easier for false information to mix in with real or verified information. People who spread false information usually have some kind of political or social goal in mind when they spread their hoaxes. Because of this, it is of the utmost importance to come up with a trustworthy way to spot false information. This article describes a way to use deep learning to spot fake news. Methodology is made up of a set of input data. The information in this dataset comes from the social networking site Twitter. First, the raw data that is being used are preprocessed. Stop word removal, stemming, and tokenization are the main parts of data preprocessing. The NLTK library is used to get rid of stop words. Porter’s Algorithm is used to do stemming. N-gram model is used to do tokenization. LSTM, CNN, and AdaBoost algorithms are used to build the model. Results have shown that LSTM is better than CNN and AdaBoost in terms of accuracy, specificity, and sensitivity. LSTM has achieved an accuracy of 99.24% for fake news detection. Specificity of LSTM is 99.2%. LSTM’s sensitivity is 98.67%. LSTM has achieved an accuracy of 99.24% for fake news detection. Specificity of LSTM is 99.2% and sensitivity is 98.67%. © The Author(s) 2025.

Author keywords

deep learning; fake news detection; Long Short-Term Memory (LSTM); N-gram; porters stemming; social networks

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