

# Convolutional Neural Network (CNN) with Bat Algorithm Optimization and Word2Vec Feature Expansion for Information Credibility Detection on Social Media X

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**Abstract**— X is one of the most popular social media platforms for rapidly disseminating information. However, not all information circulating on X is credible; there are hoaxes and rumors, especially during election periods when many bot and buzzer accounts spread information. Therefore, there is a need for an information credibility detection model on X. This research proposes an information credibility detection model using CNN with Bat Algorithm optimization and Word2Vec feature expansion. Six experimental scenarios were conducted using a dataset containing 54,766 posts from X to measure the model's accuracy. These six scenarios include the data split test, max feature test, n-gram variant test, Word2Vec feature expansion test, RoBERTa semantic feature test, and Bat Algorithm optimization test. During the feature expansion process, the X corpus, Indonews corpus, and their combination will be used to create corpus similarity. The Indonews corpus dataset was created from five Indonesian news portals: Detik.com, Metro TV News, CNBC Indonesia, Tirto.id, and Antara News. Then, the optimization process using Bat Algorithm aims to find the best values for CNN parameters, including the number of filters in the convolutional layer, filter size, dropout rate, and the number of neurons in the hidden layer. The results of these six experiments show that Word2Vec feature expansion, adding RoBERTa semantic features, and optimizing CNN using Bat Algorithm can improve the accuracy of the developed model. The accuracy increased by 1.17% from the baseline of 87.92% to 88.95%.

**Keywords**—classification, credibility, cnn, word2vec, bat algorithm