Demistifying 'Fake News': Evaluating Media-Borne Misinformation Through the Novel Application of AI Powered Sentiment Analysis

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This paper presents a deep learning model to detect ‘fake news’ through tone and sentiment in text. The primary challenge facing researchers in the ‘fake news’ detection field is a deficit of trustworthy and representative data, coupled with the struggle against disinformation propagators who adapt to evade the latest detection techniques. This research addresses both of these problems, by training a neural network algorithm on a dataset of 40,000 expertly labeled articles, and applying sentiment analysis tagging procedures to detect ‘fake news’ not by its content, but through the emotion conveyed in the text. The sentiment dictionary employed was the Harvard General Inquirer lexicon, which contains more tonal categories than all comparable dictionaries used in the existing literature. The main goal of this work was to determine whether sentiments are a strong indicator of falsity in a text. To test this, the data was vectorized and split into a combination of sentiment categories, and evaluated through three machine learning classifiers; Naive Bayes, Logistic Regression, and a Perceptron neural network. Notably, the neural network yielded a 94% accuracy rate, with a 0.98 AUC value, outperforming the majority of existing detection models. Additionally, the results suggest that ‘fake news’ articles are highly associated with personal pronouns (you/yours), gendered language (he/her), and overstatements. This indicates that ‘fake news’ uses personalized appeals, social categories, and hyperbole to mislead. These findings establish sentiment analysis as a high-performing detector of textual veracity and isolate several categories which are high indicators of misinformation.

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Second Award of $2,000