

Fake News Detection on Social Media Using Natural Language Processing: A Comparative Study of Machine Learning and Transformer Models

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Abstract:

The heavy reliance on social media for gathering news has enabled quick spread of false information, especially during events such as elections and medical emergencies. Due to large amounts of information on social media, it becomes difficult to test if the information is legitimate or fake. To test the effect of using Natural Language Processing to determine whether a piece of news is true or fake, this study conducted an experiment comparing the efficiency of transformer-based deep learning models with traditional machine learning models. Two benchmark datasets were used in this experiment: the first dataset was FNC-1, for multi-class stance detection, and the second dataset was FakeNewsNet, for binary stance classification. The overall findings indicate that while ensemble machine learning models performed well on the FNC-1 dataset, transformer-based models performed significantly better in determining if the news in the FakeNewsNet dataset is real or fake.

Keywords:

DeBERTa, Fake News Detection, Machine Learning, Natural Language Processing, Transformer Models.