Abstract - Fake News Detection Project

The proliferation of false news through digital media presents a serious challenge to societal stability and informed public discourse. This project proposes a comprehensive fake news detection system using both Machine Learning (ML) and Deep Learning (DL) techniques. Utilising the ISOT dataset comprising labeled real and fake news articles, we implemented extensive preprocessing and feature extraction methods such as TF-IDF and GloVe embeddings to enhance textual understanding. Multiple ML models including Support Vector Machines, Random Forest, Logistic Regression, and Naïve Bayes were employed, alongside DL models like LSTM, BiLSTM, CNN, GRU, and simple neural networks. Experimental results demonstrate that a hybrid approach integrating ML and DL models significantly improves detection accuracy. The system developed contributes to safeguarding information integrity and mitigating the impact of disinformation online.

The spread of false news through digital media poses a serious threat, promoting disinformation and widening societal divides.   
This project addresses the problem by developing an effective fake news detection system using both Machine Learning (ML)   
and Deep Learning (DL) techniques. Using the ISOT dataset, which contains labeled true and false news articles, we applied   
comprehensive preprocessing methods to improve model performance. We employed a range of ML models including Support Vector   
Machines (SVM), Random Forest, Logistic Regression (LR), and Multinomial Naïve Bayes (NB). In parallel, we explored DL models   
such as Long Short-Term Memory networks (LSTM), Convolutional Neural Networks (CNN), Bidirectional LSTM (BiLSTM), Simple Neural   
Networks (NN), and Gated Recurrent Unit (GRU).   
  
Feature extraction techniques such as TF-IDF and GloVe embeddings were used to enhance the model's ability to understand   
textual data. Our findings suggest that a hybrid approach that combines the strengths of ML and DL offers a scalable and   
efficient solution to the challenge of fake news detection. The system developed contributes significantly to maintaining   
information integrity and promoting a more informed public discourse.