Fake News Detection Using NLP

Problem Statement:

The proliferation of fake news in the digital age poses a significant threat to information

integrity and public trust. In this era of information overload, distinguishing between genuine

news articles and fabricated ones has become a pressing concern. To address this challenge, our

project aims to develop a robust and accurate model for automated fake news detection.

Technique:

Our project leverages Natural Language Processing (NLP) techniques to build a sophisticated

machine learning model. We will analyze a comprehensive dataset containing both genuine and

fake news articles' titles and text. By applying advanced NLP algorithms and feature

engineering, we will extract meaningful patterns, linguistic cues, and semantic relationships

from the textual content.

The key techniques and components of our approach include:

Text Preprocessing:

Cleaning and preprocessing the text data by removing stopwords , punctuation, and special characters. Tokenization and stemming/lemmatization will also be

applied to standardize the text.

Feature Extraction:

Utilizing various NLP techniques, such as TF-IDF (Term Frequency-Inverse

Document Frequency) and Word Embeddings (e.g., Word2Vec or GloVe) to represent words and

phrases in a numerical format.

Model Selection:

Evaluating different machine learning and deep learning algorithms for

classification tasks, such as Logistic Regression, Random Forest, Support Vector Machines, and

Neural Networks (e.g., LSTM or Transformer-based models).

Model Training:

Splitting the dataset into training and testing sets to train the chosen model.

We will also explore techniques like cross-validation for hyperparameter tuning to optimize

model performance.

Evaluation Metrics:

Assessing the model's performance using evaluation metrics such as

accuracy, precision, recall, F1-score, and ROC-AUC to ensure its effectiveness in distinguishing

fake from real news.

Explainability:

Implementing techniques to interpret and explain the model's predictions, such

as feature importance analysis and attention mechanisms.

Deployment:

Developing a user-friendly interface or API that allows users to input news articles

and receive real-time predictions about their authenticity.

By combining these NLP techniques and machine learning methods, our project aims to

contribute to the ongoing efforts to combat the spread of misinformation by providing a reliable

tool for fake news detection

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