N.L.P

Project Proposal

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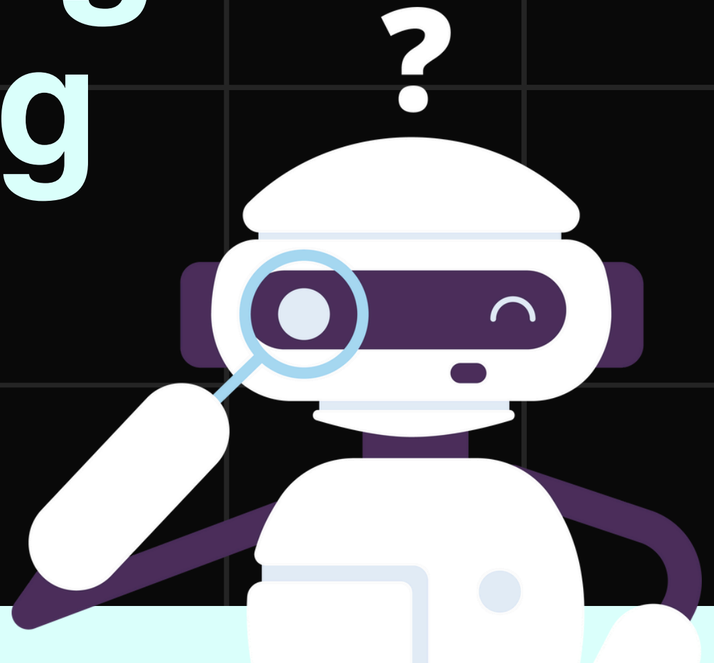
Problem Definition

Motivation: In the digital age, the spread of fake news has become a global concern. It can influence elections, public health, and trust in institutions. Detecting fake news automatically helps reduce the damage caused by misinformation.

Problem Definition:
- Input: News article (title, author, text)
- Output: Binary label – Fake or Real
- NLP Task: Text Classification

Challenges:
- Fake and real news can be written in similar journalistic styles
- Variation in article length and tone
- Sophisticated writing makes fake articles hard to detect

Dataset for Training and Testing



Dataset

We use the 'Fake and Real News Dataset' from Kaggle. Each entry includes title, text, subject, date, and author.

Labels

Supervised learning – binary classification: Fake or Real

Preprocessing

Cleaning HTML, removing punctuation, stopword removal, etc. We will experiment withusing only title, only body, or both.

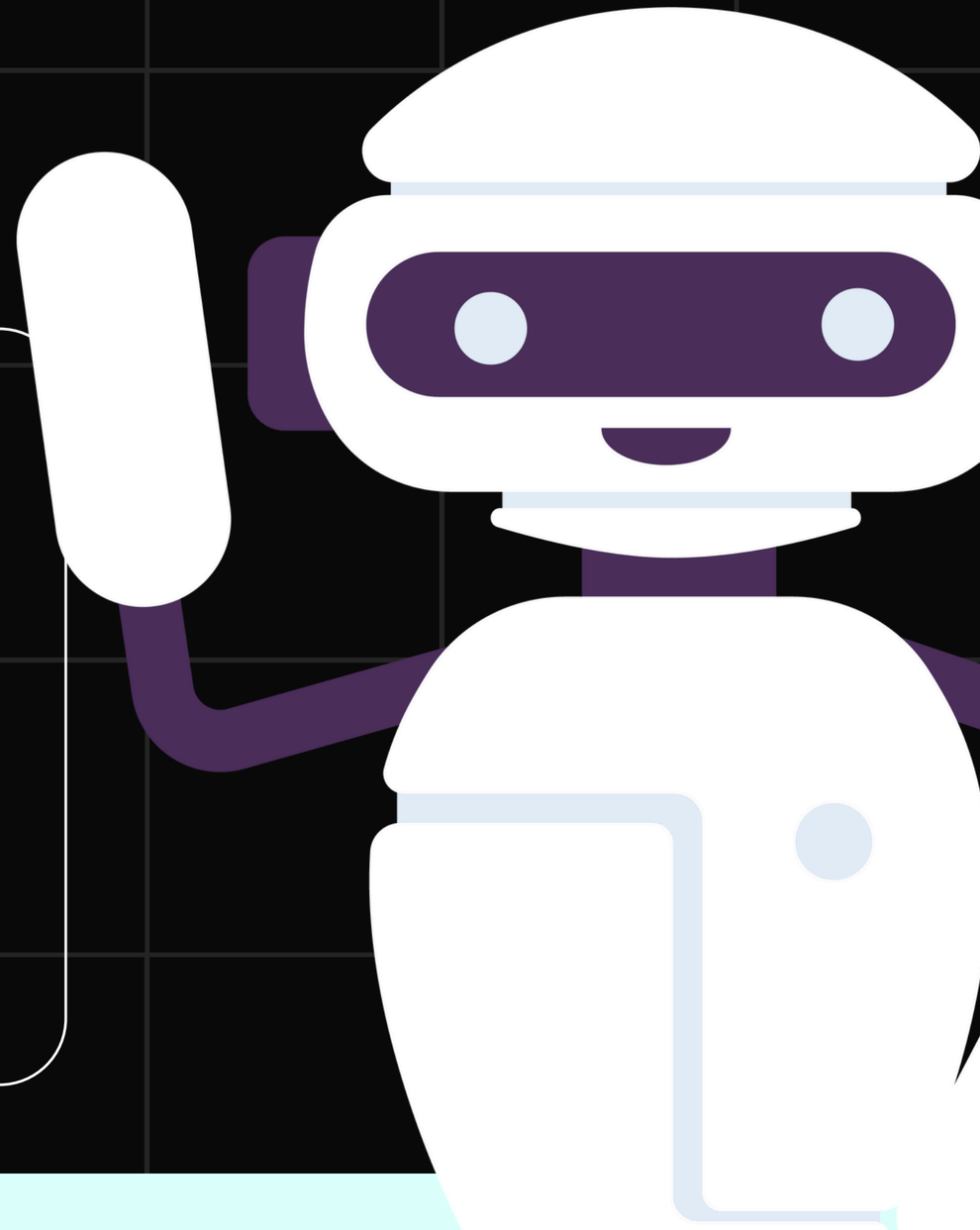
Examples

TITLE 1

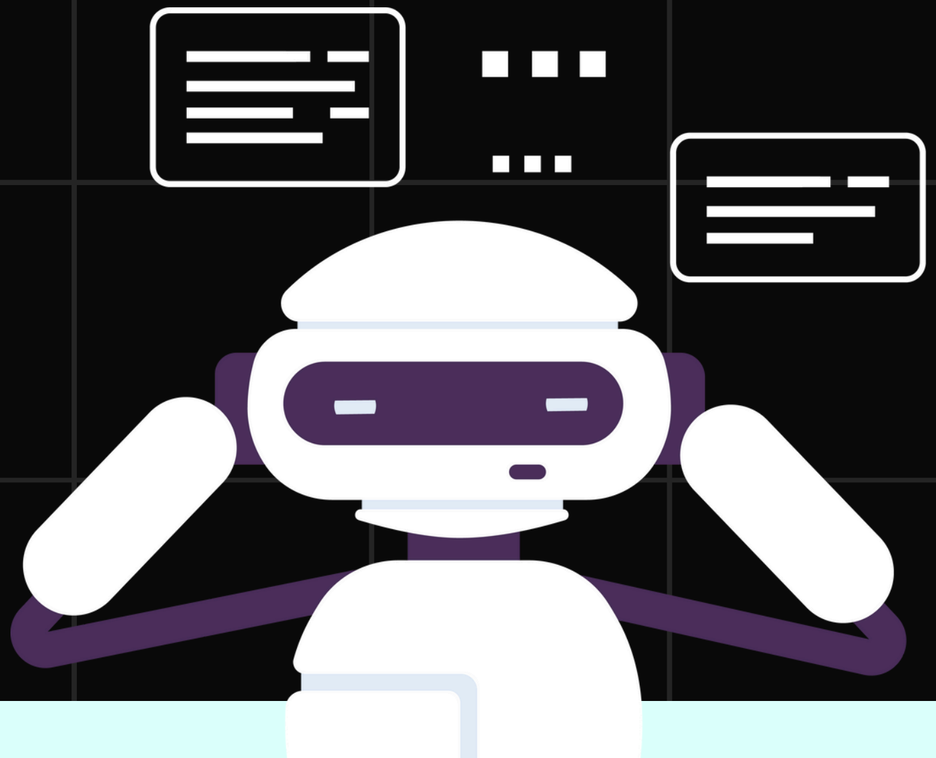
‘Obama caught on secret tape’
→ Label: Fake

TITLE 2

‘UN plan to reduce carbon emissions’
→ Label: Real



Evaluation and Metrics



Evaluation Metrics:

- Accuracy
- Precision: Proportion of predicted Fake articles that are actually Fake
- Recall: Proportion of actual Fake articles identified correctly
- F1-score: Harmonic mean of Precision and Recall (useful with imbalanced classes)

Baseline

Naive Bayes / Logistic Regression for comparison

Evaluation Strategy

- Train/Test split (e.g., 80/20)
- Cross-validation to ensure stable performance

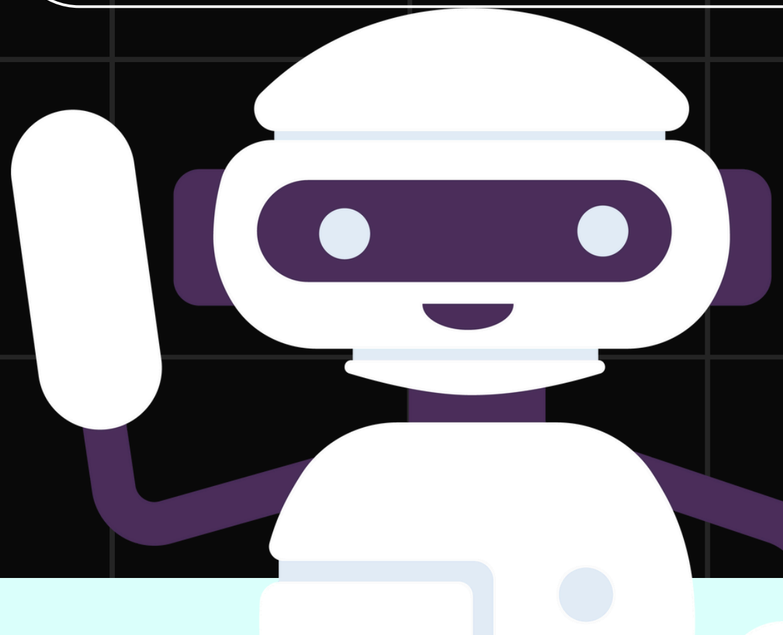
Advanced Models

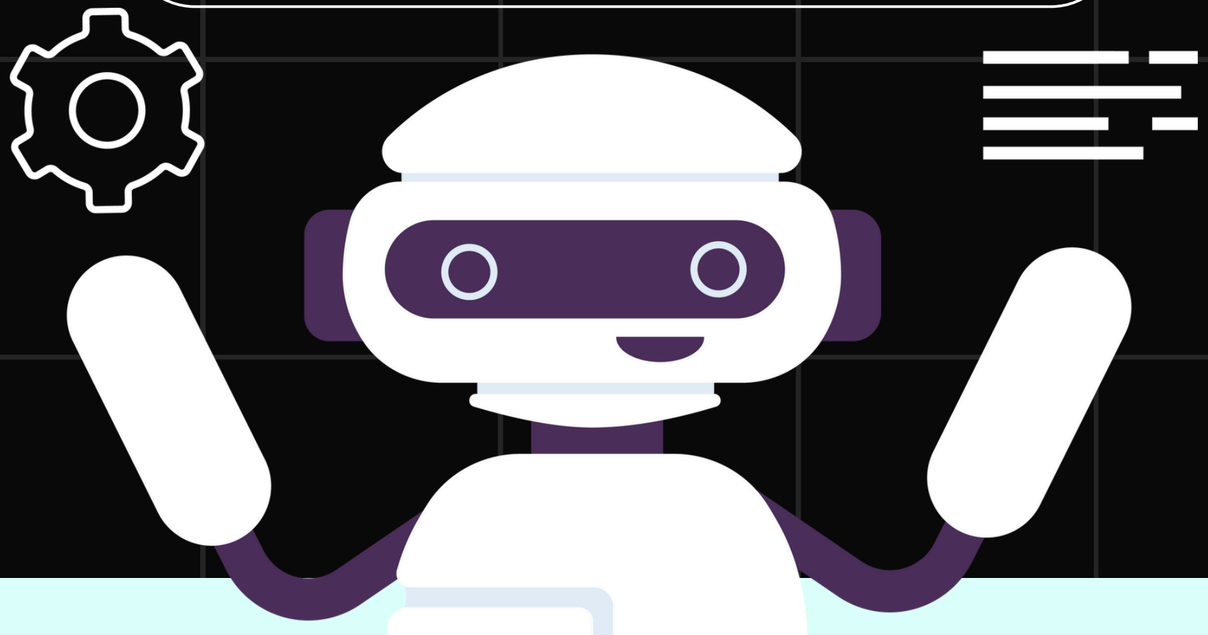
Using pre-trained LLMs like BERT or RoBERTa for embeddings or fine-tuning

Project Novelty

- Incorporate metadata (e.g., author, subject) as model features
- Generate synthetic news samples using LLMs for data augmentation

- Include sentiment analysis features – fake news often uses dramatic tone
- Combine LLM embeddings with classical models like XGBoost for hybrid modeling





Thank you