

AI-BASED FAKE NEWS DETECTION USING NLP

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INTRODUCTION

- ❑ Fake news has become a significant issue in today's digital world, influencing public opinion, elections, and even public health.
- ❑ Fake news spreads fast on social media and can mislead people.
- ❑ Traditional fact-checking is slow, so AI and NLP (Natural Language Processing) help in detecting fake news automatically.
- ❑ This paper reviews different methods and techniques used to find and stop fake news.

APPLICATION AREAS

- ❑ **Social Media** – Helps detect fake news on platforms like Facebook, Twitter, and WhatsApp.
- ❑ **Politics & Elections** – Identifies false political claims and misinformation.
- ❑ **Health News** – Finds fake medical information, like false COVID-19 cures.
- ❑ **Cybersecurity** – Prevents online scams and phishing attacks.
- ❑ **News Websites & Journalism** – Assists in verifying news before publishing

METHODOLOGIES

- ❑ Rule-Based Methods
- ❑ Machine Learning (ML) Models
- ❑ Deep Learning Models
- ❑ Graph-Based Learning
- ❑ Explainable AI (XAI)
- ❑ Adversarial Training

ALGORITHMS / TECHNIQUES

Optimization Techniques:

- Particle Swarm Optimization (PSO)
- Genetic Algorithm (GA)
- Adversarial Training

Data Processing Techniques:

- TF-IDF & Word Embeddings
- Named Entity Recognition (NER)
- Knowledge Graphs

Machine Learning Models:

- BERT, RoBERTa, XLNet
- CNN + LSTM Hybrid
- SVM (Support Vector Machine)
- XGBoost, LightGBM, AdaBoost
- Graph Neural Networks (GNNs)
- SHAP & LIME (Explainable AI)

TOOLS & TECHNOLOGIES

- ❑ **Programming Languages** – Python, TensorFlow, PyTorch.
- ❑ **NLP Libraries** – NLTK, spaCy, Hugging Face Transformers.
- ❑ **Datasets** – LIAR, FakeNewsNet, ISOT.
- ❑ **Cloud Platforms** – Google Colab, AWS, Azure AI.

CURRENT/LATEST R&D WORKS IN THE FIELD

- ❑ **Improving Transformer Models** – Making AI more accurate in fake news detection.
- ❑ **Multimodal Fake News Detection** – Checking text, images, and videos for fake news.
- ❑ **Reducing Bias in AI** – Making AI fair for all types of news.
- ❑ **Real-Time Fake News Detection** – AI that updates and learns from new fake news trends.

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