



Local Language News Verifier – An AI-Based Fake News Detection System

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ABSTRACT :

Unprecedented levels of disinformation have resulted from the quick spread of social media platforms, especially in regional languages where there are few resources for fact-checking. During elections, fake news fuels public anxiety, social unrest, and disinformation, all of which have serious societal repercussions. This study introduces the Local Language News Verifier, an AI-powered online tool that can validate news in a variety of media, such as text, photos, audio, and video. To evaluate credibility against reliable news sources and APIs, the system uses speech-to-text transcription for audio and video, optical character recognition (OCR) for images, and AI-driven classification algorithms. Accessibility is improved by providing verification results in the user's native tongue (such as Tamil, Hindi, or Gujarati). The system's potential to reduce misinformation in regional languages is highlighted by the experimental results, which show high accuracy and effectiveness. In order to combat fake news in India, this study also suggests future improvements like deep learning models and real-time verification tools.

Keywords: Fake News Detection, Artificial Intelligence, Natural Language Processing, OCR, Speech Recognition, Multimodal Verification, Local Language Verification

I. Introduction

The dissemination of information has changed in the digital age. News consumption is now dominated by platforms like WhatsApp, Facebook, Instagram, and local blogs rather than traditional newspapers and television channels. Although this democratization gives users more power, it also makes it possible for fake news to spread quickly, which frequently results in false information, panic, and social unrest.

Given that over 80% of internet users in India access content in regional languages, the issue is particularly serious there. Misinformation spreads virally because many users rely on videos, memes, and forwarded messages without doing any research. Conventional fact-checking groups find it difficult to stay up, especially when it comes to multimedia and local languages.

The **Local Language News Verifier** addresses these challenges by offering a scalable, AI-powered solution capable of:

1. Manage various input formats, including text, images, audio, and video.
2. Giving the user access to verification results in their native tongue.
3. Making use of reliable news sources in conjunction with AI-based classification.

By bridging the gap between information distribution and verification, this system makes fact-checking efficient and available in a variety of media and languages.

II. Literature Review

Machine Learning Approaches

Text-based fake news detection has made extensive use of traditional machine learning models like **Random Forests**, **Support Vector Machines** (SVMs), and **Logistic Regression**. These models work well on English datasets and are based on feature extraction methods like TF-IDF and word embeddings. However, the lack of labeled datasets limits their performance for regional languages.

Model	Dataset	Accuracy	Notes
Logistic Regression	LIAR Dataset (English)	85%	Text-only
SVM	ISOT Dataset	87%	Binary classification

Random Forest	FakeNewsNet	83%	Requires feature engineering
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Deep Learning Approaches

Deep learning models are better at capturing meaning and context. **LSTM networks** can model dependencies that happen in order, while **Transformers (BERT, RoBERTa)** are the best at classifying text.

- **BERT:** A pretrained transformer model that can find fake news in English with about 90% accuracy.
- **IndicBERT:** A multilingual version that works with Indian languages and is good for Hindi, Gujarati, Tamil, and more.

Challenges include high computational resources and the need for large labeled datasets.

Multimedia Verification

Recent research includes multimodal verification:

- **OCR for Images:** Uses Tesseract or EasyOCR to get text out of memes and infographics.
- **Speech-to-Text for Audio/Video:** Uses Whisper or Google Speech Recognition APIs to turn spoken words into text.
- **Cross-modal Verification:** Checks the extracted content against news sources that are known to be reliable.

The proposed system is needed because most current systems only support English and don't support regional languages.

Indian Context Studies

Not many studies look at false information in Indian languages. Websites like AltNews and Factly let people check facts by hand, but they don't work for multimedia content. The fact that there is no automated, AI-powered local language verification shows how new this project is.

Proposed System Architecture

The **Local Language News Verifier** consists of five main modules:

Input Module

Users can upload or paste:

- Text files
- Images (memes, screenshots)
- Audio clips (voice notes)
- Video snippets

Preprocessing & Extraction

- **Text:** Direct processing with NLP pipelines.
- **Images:** OCR (Tesseract/EasyOCR) to extract text.
- **Audio/Video:** Speech-to-Text using Whisper/OpenAI API.

Pseudocode Example:

```
if input_type == 'image': text = OCR(image_file)
elif input_type in ['audio', 'video']: text = SpeechToText(file)
else:
    text = raw_text
```

Verification Engine

1. Use APIs to compare the extracted text with reliable news sources:
 - AltNews dataset, Google Fact Check API, and NewsAPI
2. Credibility is assessed by an AI-based classification model (Logistic Regression + BERT).
3. The final classification—Real, Fake, or Needs More Proof—is based on confidence scores.

Output Classification

- **Real:** Confirmed by multiple sources
- **Fake:** Contradicted by verified sources

- **Needs More Proof:** Insufficient data

Local Language Translation

APIs (like Google Translate) are used to translate results into the user-selected language, such as Tamil, Hindi, Gujarati, etc.

System Workflow Diagram (Description for Word):

- Step 1: User uploads input →
Step 2: OCR/Speech-to-Text →
Step 3: Text analysis & API verification →
Step 4: AI classification →
Step 5: Local language output

Dataset & Experimental Setup

- **Data Sources:**
 - Regional news websites
 - WhatsApp/Telegram forwarded messages
 - AltNews datasets
- **Labeling:** Real/Fake manually verified
- **Preprocessing:** Text normalization, stop-word removal, lemmatization
- **Train/Test Split:** 80/20
- **Evaluation Metrics:** Accuracy, Precision, Recall, F1-score

III. Implementation Details

Frontend

- **React.js + Vite:** Fast and reactive UI
- **Tailwind CSS:** Responsive design
- **Axios:** API calls

Backend

- **FastAPI (Python):** Handles file uploads, AI pipelines, API calls

AI Components

- OCR (Tesseract/EasyOCR)
- Speech-to-Text (Whisper/OpenAI API)
- Fake News Classification: Logistic Regression + BERT

Database

- PostgreSQL stores verification results, user history, and logs

Deployment

- Docker containers for scalability and easy deploymen

Results & Discussion

Input Type	Accuracy	Precision	Recall	F1-score
Text	88%	0.87	0.88	0.87

Image	82%	0.80	0.83	0.81
Audio/Video	79%	0.78	0.79	0.78

- **Case Study 1:** A viral meme that contradicted verified sources was flagged as fake.
- **Case Study 2:** Following cross-verification, a WhatsApp voice note in Hindi was deemed authentic.
- **Finding:** Noisy audio and OCR errors marginally impair accuracy.

Comparison with Existing Systems

Feature	Existing System	Proposed System
Input Formats	Text only	Text, Image, Audio, Video
Language Support	English	Multiple Indian languages
Real-time Verification	Limited	Scalable (Future Mobile/Extension)
Accuracy	80-85%	79-88%
Multimedia Integration	No	Yes

Unique Contribution: Multi-format, local language verification with AI-assisted automation.

Limitations

- Accuracy is decreased by noisy audio and poor image quality.
- Variations in dialect impact the ability to recognize speech.
- Reliance on third-party APIs
- Requirements for computational resources

Future Scope

- Use IndicBERT to improve multilingual functionality.
- Browser extensions and mobile apps for instantaneous verification
- Blockchain-based source verification
- Enhancement of local languages in crowdsourced datasets

Conclusion

The **Local Language News Verifier** is an AI-based system that can find false information in text, images, audio, and video. The system uses OCR, speech recognition, AI classification, and translation to give users in their own languages easy and reliable ways to check their work. The project shows a useful, scalable way to fight misinformation in India and sets the stage for tools that can check facts in real time. Its unique contribution is that it bridges the language gap and can handle multimedia inputs, which makes fact-checking more accessible and useful.

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