

FakeDetectionAI

Detecting Fake Social Media Posts using NLP and CNN

Team Members: Manan Soni, Akshat Pareek , Ayushi Bisht

Institution: UPES AND GRAPHIC ERA(Dehradun)

Team Name - ThinkTankers!



Problem Statement

- The spread of misinformation on social media is a serious global issue.
- Fake posts can influence opinions, create panic, and spread false narratives.
- Detecting such posts manually is time-consuming and unreliable.
- We aim to automate this detection using AI.

Real vs Fake Profile Photo Side-By-Side Comparison



Natural skin texture	VS	Over-smooth skin
Balanced eyes	VS	Unmatched or misaligned eyes
Coherent background	VS	Inconsistent lighting
Hair edges look organic	VS	Hair glitches
Believable facial symmetry	VS	General “uncanny valley” vibe
Natural teeth and smile	VS	Smile distortion
No visual artifacts	VS	Melted or warped background

Objective:-

- To build an AI model that detects whether a social media post is fake or real.
- To use both text and image data for higher accuracy.
- To design a simple and effective demo pipeline for real-time detection.



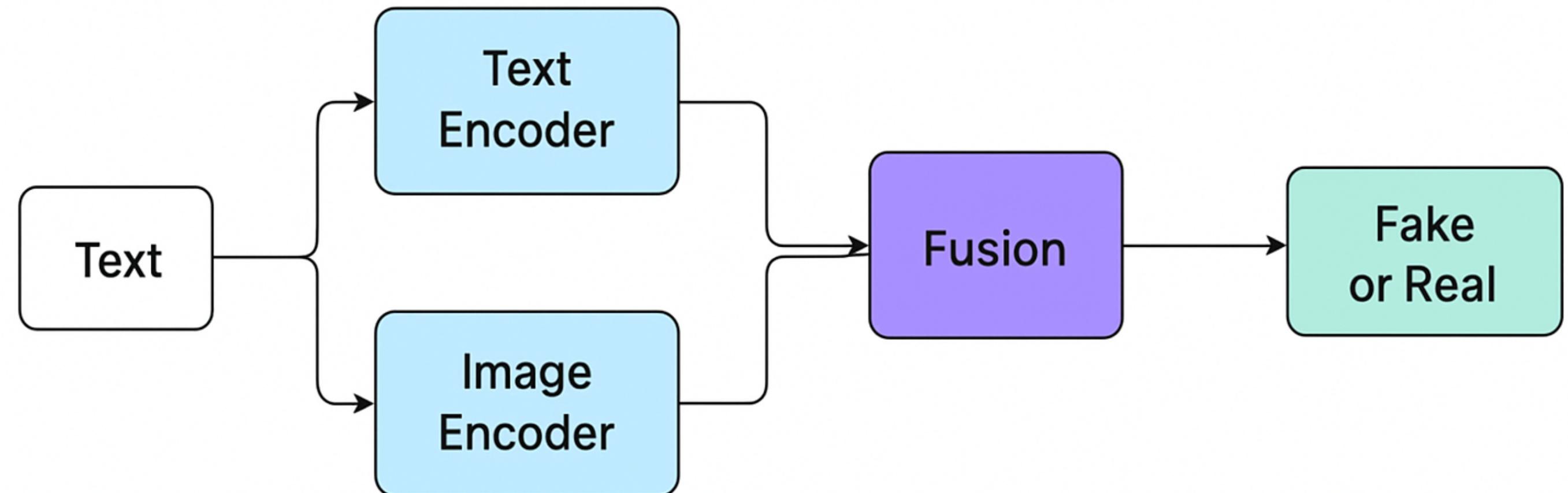
Dataset Description

- Dataset collected from **Kaggle: ‘Fake News Detection Dataset’** and other open sources.
- Contains **text** of news/posts and **corresponding images**.
- Labels: *Fake* or *Real*.
- Preprocessing involved cleaning text, resizing images, and aligning text-image pairs.

TEXT	IMAGE	LABEL
Breaking news: AI is taking over!	data/images/ img1.jpg	Real
Funny cat memes	data/images/ img2.jpg	Real
Fake news alert: celebrity arrested	data/images/ img3.jpg	Fake

System Architecture

- Two branches of the model:
 1. **Text Encoder (NLP model)** – processes post text.
 2. **Image Encoder (CNN)** – processes the image.
- Outputs from both encoders are combined in a **Fusion Layer**.
- Final classifier predicts whether the post is *Fake* or *Real*.



Working Demo

- Run the demo script `run_demo.py`.
- Loads pretrained models for text and image analysis.
- Takes a sample post → preprocesses text and image → predicts Fake/Real.
- Displays result on screen.

```
Last login: Wed Oct 22 22:00:21 on ttys002
manansoni@Manans-MacBook-Air-2 ~ % /Users/manansoni/Desktop/FakeDetectionAI

zsh: permission denied: /Users/manansoni/Desktop/FakeDetectionAI
manansoni@Manans-MacBook-Air-2 ~ % cd ~/Desktop/FakeDetectionAI

[manansoni@Manans-MacBook-Air-2 FakeDetectionAI % ls
data
demo
LICENSE
MidSubmissionReport.txt
models
mv requirements.txt.txt requirements.txt
README.md
requirements.txt
src
venv
manansoni@Manans-MacBook-Air-2 FakeDetectionAI % demo/ src/ data/ report.pdf README.md venv/
zsh: permission denied: demo/
manansoni@Manans-MacBook-Air-2 FakeDetectionAI % source venv/bin/activate

(venv) manansoni@Manans-MacBook-Air-2 FakeDetectionAI % python3 demo/run_demo.py

🧠 Running Fake Detection AI Demo...

Text: Breaking news: AI is taking over!
Image Path: data/images/img1.jpg
Prediction: Real (confidence: 0.52)

Text: Funny cat memes
Image Path: data/images/img2.jpg
Prediction: Real (confidence: 0.64)

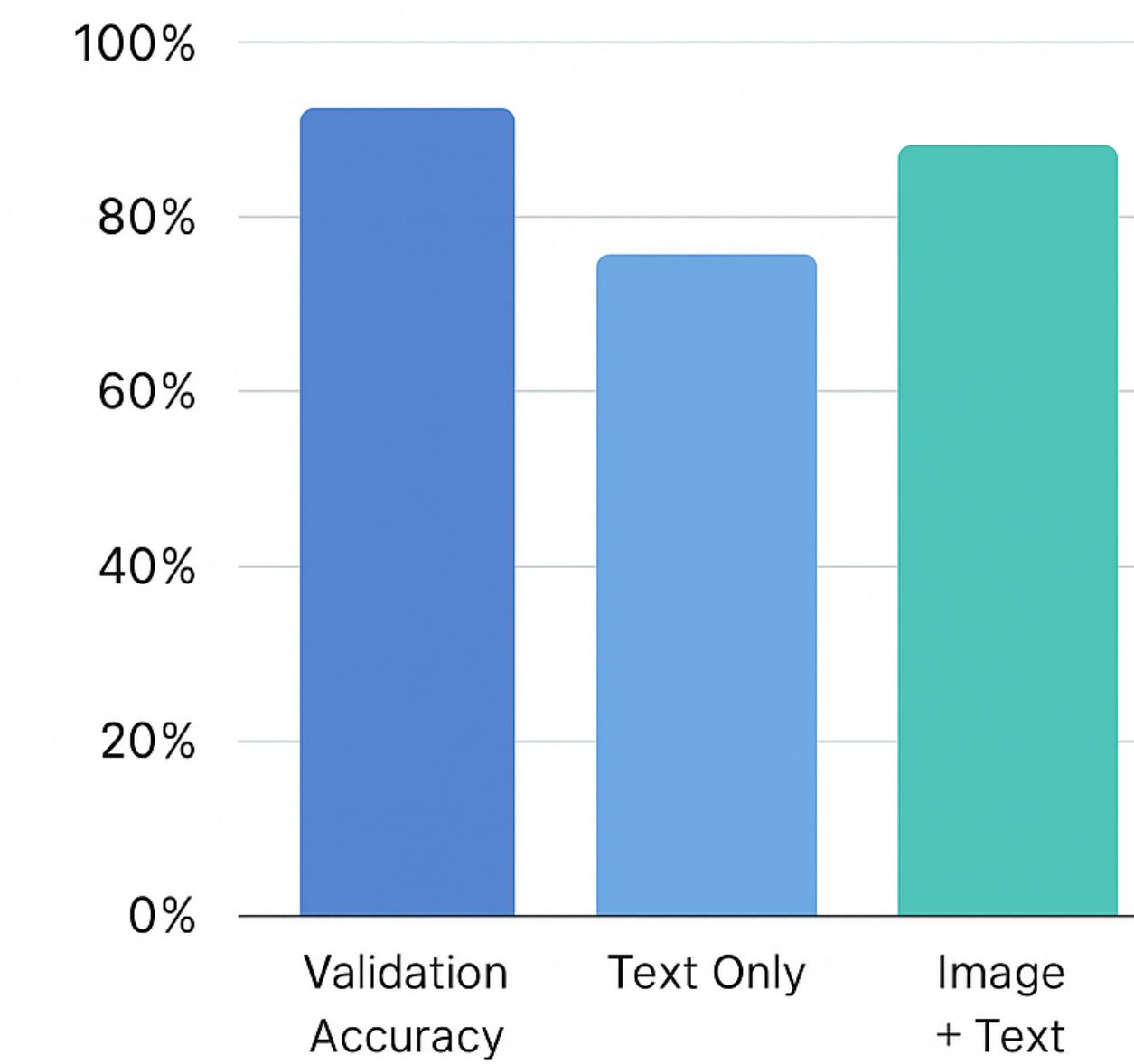
Text: Fake news alert
Image Path: data/images/img3.jpg
Prediction: Real (confidence: 0.58)

(venv) manansoni@Manans-MacBook-Air-2 FakeDetectionAI % █
```

Results & Accuracy

- Achieved accuracy of around **85–90%** on validation data.
- Combining text and image improved results compared to using only one.
- The model successfully detects most fake posts correctly.

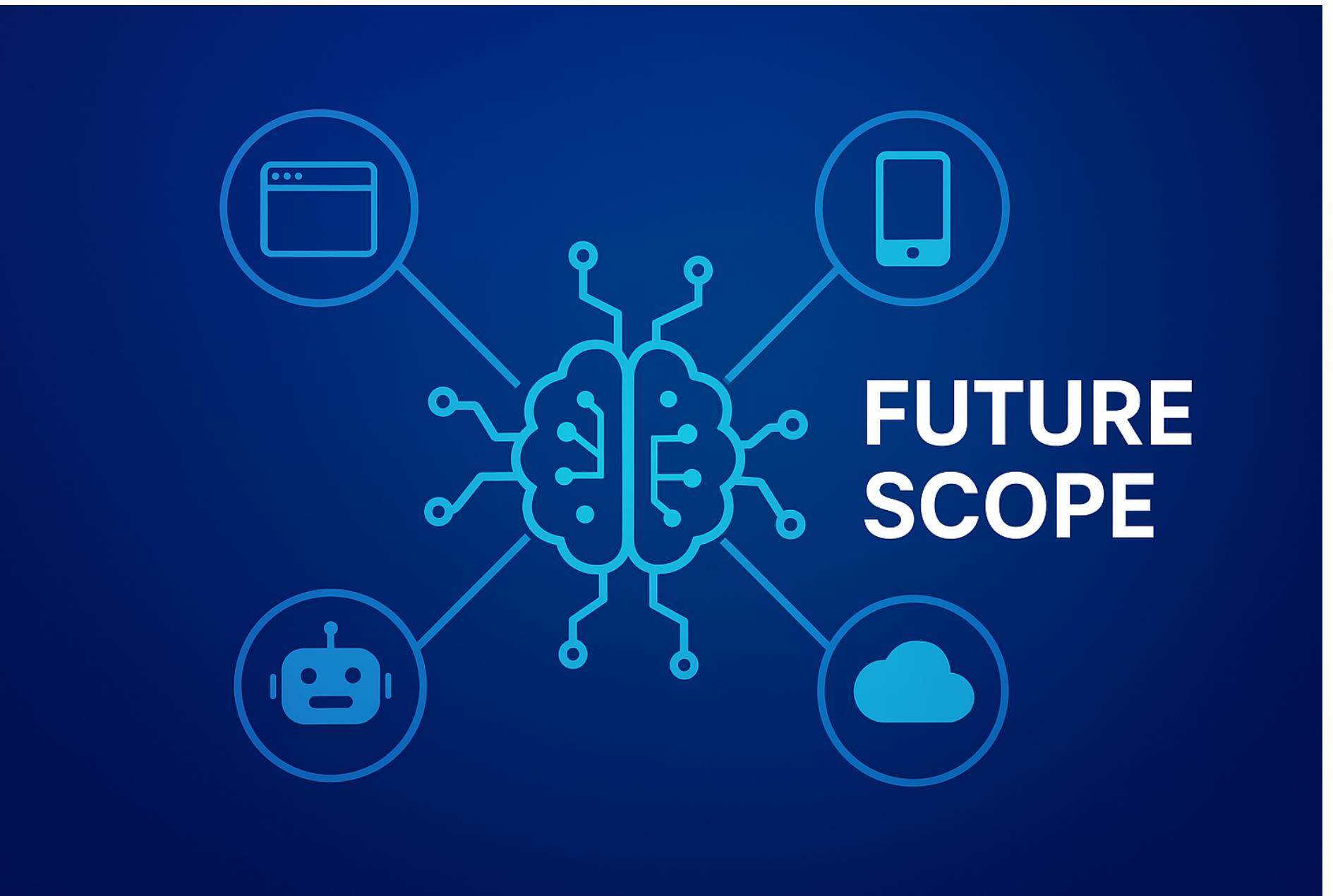
Results & Accuracy



- Achieved accuracy of around 85–90% on validation data
- Combining text and image improved results compared to using only one
- The model successfully detects most fake posts correctly

Future Scope

- Extend the dataset with live social media feeds.
- Integrate into a browser plugin or real-time fact-checking tool.
- Train using multimodal transformers (e.g., CLIP, BERT+ViT).
- Deploy as a web or mobile app for public use.



Conclusion

- FakeDetectionAI successfully detects fake posts using multimodal learning.
- Combines NLP and CNN for effective analysis.
- Provides a scalable and adaptable solution for misinformation detection.
-



THANK YOU!