AI-Powered Deep Fake Detection

INTRODUCTION

Deepfake technology leverages artificial intelligence (AI) to create hyper-realistic videos that manipulate facial expressions, voice, and context. While innovative, this technology presents serious risks, including political misinformation, financial fraud, and identity theft. Current detection tools often lack scalability, transparency, or user-friendly design. This project addresses these challenges by developing a Django-based web application that combines computer vision and deep learning to detect deepfakes in real time, ensuring usability and accuracy.

PROBLEM STATEMENT

Existing deepfake detection systems have key limitations:

1. Slow processing speeds, limiting real-time analysis.

2. Complex interfaces, making them inaccessible to non-technical users.

3. Opaque decision-making, lacking interpretability (e.g., confidence scores).

METHODOLOGY

Hybrid Detection Approach :

1. **Computer Vision Pipeline** : Frame Extraction, Facial Analysis

2. **Deep Learning Models**: PyTorch models, CNNs and RNNs

User Interface : Frontend (HTML/CSS/JavaScript), Backend (Django)

Workflow : uploads a video, System extracts frames, detects faces and display confidence scores

SOLUTION OFFERED

- Automated DeepFake Detection , Real-time Feedback(confidence scores), User-Friendly Web Application

END USERS

- Journalists/Media, Social Media Platforms, General Public

TECHNOLOGIES USED

Programming Language (Python)   **Data Handling**   (Pandas, NumPy, scikit-learn, PIL)   **Web Framework** (Django, HTML/CSS/JS)   **System Interaction** (OS module, UUID)   **Deep Learning**   (PyTorch, Torchvision)   **Progress Tracking**   (TQDM)   **Computer Vision** (OpenCV ,face_recognition)

RESULT

- Expected >90% accuracy on benchmark datasets.

- Real-time processing (<30 seconds for a 15-second video).

CONCLUSION

This project bridges the gap between advanced AI research and practical tools by combining Django's scalability, PyTorch's deep learning capabilities, and OpenCV's real-time processing. Key achievements include:

- A hybrid detection system for robust deepfake identification.

- A user-friendly interface democratizing access to AI-powered verification