BlackNWhite Documentation

AI-Powered Fake News & Deepfake Detection Platform

1. Introduction

a. In today's digital age, the line between real and fake has never been blurrier. From sensationalist fake news to disturbingly realistic deepfakes, misinformation spreads faster than ever. That's where BlackNWhite comes in — your AI-powered ally in the fight against disinformation.

b. BlackNWhite is a modern web platform that blends the power of AI, natural language processing, and computer vision into a seamless experience. Built on the robust MERN stack and enhanced with scalable DevOps pipelines, BlackNWhite not only detects falsehoods but does so in real time, across text, images, and even video content.

2. Problem Statement

a. Fake news and deepfakes aren't just harmless pranks anymore. They can sway elections, destroy reputations, and ignite violence. Traditional fact-checking methods are too slow and can't keep up with the sheer volume of content being posted every second.

b. Key Challenges:

i. Manual verification is time-consuming.
ii. Existing detection platforms are fragmented.
iii. Real-time automated pipelines are lacking.
iv. Deepfakes are evolving rapidly, bypassing traditional filters.

3. Our Vision

a. BlackNWhite aims to be the single source of truth — a platform where:

i. Anyone can submit a news article or media to verify.
ii. AI models instantly validate content.
iii. Admins and moderators manage flagged posts efficiently.
iv. The system continuously improves using real-time feedback.

We don't just detect fake content. We empower people to question what they consume online.

4. Key Features

a. Fake News Detection
   i. Utilizes BERT (via HuggingFace) to analyze text. The model classifies news as **real**, **possibly fake**, or **fake**, providing a confidence score for transparency.

b. Image & Video Deepfake Detection
   i. Images: MediaPipe + DeepFace verify facial integrity and anomalies.
   ii. Videos: Frame-by-frame analysis to detect manipulation, facial swaps, and inconsistencies, VISION TRANSFORMERS

c. Real-Time AI Verification
   i. Every submission is passed through AI pipelines. Results are fast, accurate, and human-readable.

d. CI/CD Integration
   i. With GitHub Actions and Jenkins, the platform supports:
   ii. Auto-deployment after code merges
   iii. AI model testing before rollout
   iv. Security scans that block vulnerable builds
   v. Dockerised AI Model as Microservices
   vi. Deploy Over AWS EC2 Instance

e. Security-First Approach
   i. Integrated tools like:
      - Bandit (Python security)
      - Semgrep (Code pattern scanner)
      - ESLint (JS code quality) Deployments are halted if critical issues are found.

f. Admin Dashboard
   i. Monitors:
      - AI model outputs
      - User-submitted content
      - Flagged content
      - Real-time traffic and system health

g. Alerts & Monitoring
   i. GitHub Alerts

5. AI Models & How They Work

Task	Model	Library
Text Classification	**BERT**	HuggingFace Transformers
Image Deepfake Detection	**DeepFace + MediaPipe**	TensorFlow/Keras, OpenCV
Video Frame Analysis	**Custom Frame Extractor + VITCO**	Vision Transformer, OpenCV

The models are dockerised as microservices and each exposed via FAST APIs on different ports.

6. Tech Stack Overview

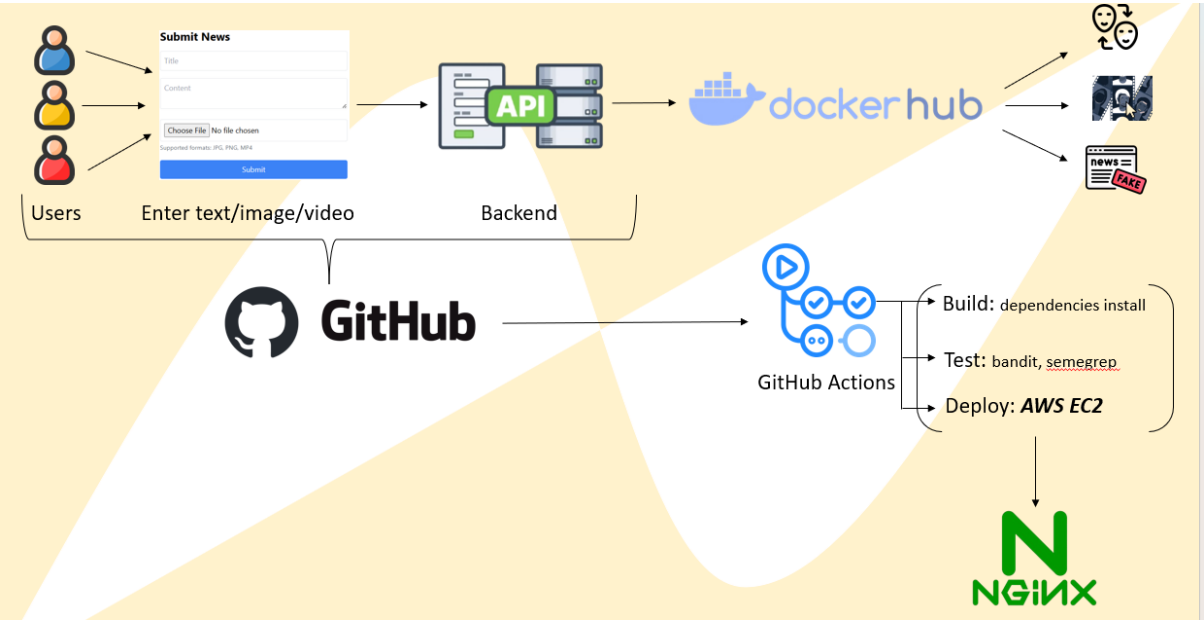
Layer	Tech
Frontend	**React.js + Tailwind + Vite**
Backend	**Node.js + Express.js**
Database	**MongoDB**
AI Microservices	**Python (Flask/FastAPI)**
DevOps	**Docker, Kubernetes, GitHub Actions**
Security	**Bandit, Semgrep, ESLint**

7. Workflow Example

a. User Submits Article → Includes title, text, optional image/video.
b. Backend Triggers AI Services
    i. Text → BERT
    ii. Image → DeepFace/MediaPipe
    iii. Video → Frame extraction + Vision Transformer + Deepfake Analysis
c. Results Stored in MongoDB
    i. Label, Confidence, Flags
d. Admin Dashboard → Shows scan results for moderation.

8. Deployment Architecture

a. Frontend: Hosted on AWS EC2 Nginx (static site generators).
b. Backend: Node.js app deployed to AWS EC2 Pm2
c. AI Services: Flask/FastAPI services on different ports (8001, 8002, 8003).
d. Docker Containers: Containers are on the Docker hub for the with all dependencies installed of the Models.



9. Future Scope

a. Add multilingual fake news detection (Hindi, Spanish, etc.)
b. Real Time Monitoring
c. Alert Notifications

10. Conclusion

BlackNWhite is more than just a project — it's a mission. A mission to restore truth in a world where misinformation thrives. By combining AI intelligence, secure DevOps, and real-time monitoring, we're building the foundation for a more trustworthy internet.

Whether you're a journalist, developer, or a concerned citizen — BlackNWhite is here to help you question, verify, and trust again.