ONLINE INTELLIGENT TOOL FOR IDENTIFYING FAKE AND REAL IMAGES

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Keywords:

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Introduction:

The project titled “Online Tool for Identifying Real and Fake Images” is designed to detect manipulated or AI-generated images by leveraging the power of Generative Adversarial Networks (GANs). In recent years, the misuse of GAN-generated images on social media has led to concerns about cyber frauds, misinformation, and identity theft. This project aims to address that challenge by providing a reliable online solution.

The system includes a user-friendly web interface where users can upload an image. The uploaded image is analysed in the backend using a trained GAN- based deep learning model, which classifies it as either Real (human- captured) or Fake (AI-generated or morphed). The GAN model is trained on datasets consisting of both authentic and fake images to learn subtle differences in texture, structure, and artifacts.

Objectives:

1. To design and develop an online user interface tool for fake images detection.
2. Analysis of real and fake morphed images on social media to avoid cyber frauds.

Methodology:

- **Description of the Project:**
    - To design and develop an online user interface tool for fake images detection.

- Analysis of real and fake morphed images on social media to avoid cyber frauds.

- **Technology Used:**
  - Programming Language (Python)
    - Python – Core language for model development, backend scripting, and logic implementation.
  - Deep Learning Framework
    - TensorFlow – For building and training deep learning models.
    - Keras (within TensorFlow) – High-level API for defining GAN, ResNet
  - Image Processing Library
    - OpenCV – Used for image preprocessing (resizing, color conversion, normalization).
  - Web Framework (Flask)
    - Flask **–** Lightweight Python framework used to create the backend and serve the trained model through a web app.
  - Frontend Technologies (HTML, CSS, JAVASCRIPT)
    - HTML – For structuring the web pages.
    - CSS – For styling and layout of the interface.
    - JavaScript – For adding interactivity and form validation.
  - Data Handling Libraries
    - NumPy – For numerical and array operations during preprocessing.
    - Pandas – For handling dataset labels and tabular data.
  - Dataset Sources
    - Real and Fake Face Dataset – Contains labeled real (human) and fake (AI-generated/morphed) images used for training the model.

It is a web- based application that allows users to upload an image through a user-friendly interface. Once the image is uploaded, it is processed by a deep learning model that has been trained to classify whether the image is real (human-captured) or fake (morphed). The backend of the application, built using the Flask framework, handles the model inference and logic, while the frontend, designed using HTML, CSS,

and JavaScript, ensures smooth interaction for the user. After analysis, the system displays the result to the user, indicating whether the image is real or fake. This prototype effectively demonstrates the feasibility of using artificial intelligence to detect image authenticity and serves as a foundation for further development and deployment. Detection of fake images on social media, cybercrime investigation, media verification, content moderation, e-governance ID checks, developer APIs, AI education, and real image validation for dating and e-commerce platforms.

Result and Conclusion:

The web application is developed using Flask for the backend and HTML, CSS, and JavaScript for the frontend. It provides quick results and an interactive experience for users seeking to verify the authenticity of images are shown below.

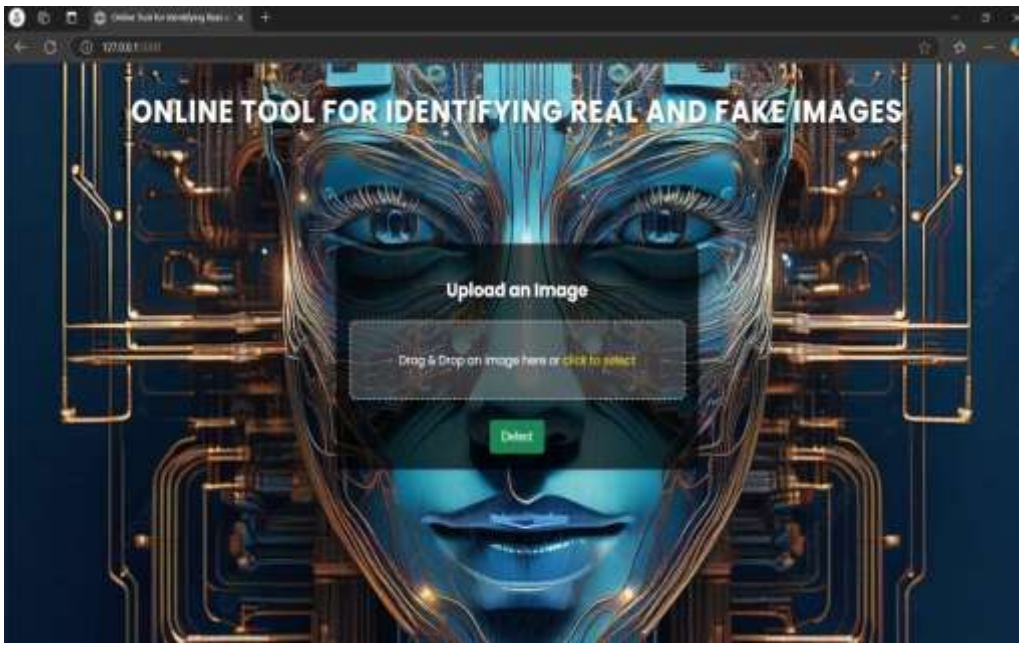

Figure :Dashboard of Online Intelligent Tool for Identifying Real and Fake Image

Figure: Detection of Real image

Figure: Detection of Fake Image

The web application is developed using Flask for the backend and HTML, CSS, and JavaScript for the frontend. It provides quick results and an interactive experience for users seeking to verify the authenticity of images.

The developed prototype successfully identifies and classifies uploaded images as real or fake using a GAN-based deep learning model. The model achieved a high level of accuracy during testing, demonstrating its ability to distinguish between human-captured images and AI-generated or morphed ones. The system performs well on various image types, providing fast and reliable classification through a simple web

interface. Additionally, the integration of the frontend and backend ensures smooth user interaction, making the tool accessible even to non-technical users. The results validate the effectiveness of using GANs for image authenticity verification. This prototype demonstrates the effective use of GANs in real-world applications and serves as a valuable tool in the fight against image-based cyber frauds and misinformation.

Future Scope:

- Enhanced with real-time image analysis for social media platforms and messaging apps.
- Extended to video deepfake detection by applying similar deep learning techniques on video frames.
- Packaged as a browser extension or mobile application, making it more accessible to end users.
- Integrated with government or legal systems for digital evidence validation in cybercrime cases.
- Improved with a larger and more diverse dataset, which can help the model generalize better to various kinds of manipulated images.