Deep Fake Image Detection Using GAN

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Abstract: *In today's digital age, the rise of deepfake technology has become a significant concern due to its ability to generate hyper-realistic but fake media content. This has led to a serious threat to the authenticity of visual data and trust in digital platforms. Traditional detection methods often fail to adapt to the rapidly evolving nature of generative models.. Our system aims to tackle this issue using advanced algorithms and techniques such as GAN (Generative Adversarial Networks), CNN (Convolutional Neural Networks), Image Processing, and Deep Learning. The system works by extracting visual features from images and detecting inconsistencies using trained deep learning models. The proliferation of deepfake technology poses a significant threat to digital content authenticity and public trust. Deepfakes utilize advanced generative models to create highly realistic but manipulated media, making it increasingly difficult to distinguish between real and synthetic content. This paper presents a comprehensive deepfake detection system that leverages Generative Adversarial Networks (GANs), Convolutional Neural Networks (CNNs), and hybrid learning techniques to accurately classify AI-generated images. Our approach integrates a user-friendly web application developed using HTML, CSS, and JavaScript for frontend interaction, and a Python Flask backend for managing deep learning model inferences. The detection engine combines models trained on diverse datasets like CIFAKE and custom fruits datasets to increase robustness against various generative patterns. This system contributes a scalable and accessible solution for combating the growing concern of synthetic media proliferation..*

Keywords: Deepfake Detection, Generative Adversarial Networks (GANs), Convolutional Neural Networks (CNNs), AI-generated Images, Hybrid Deep Learning, Image Forgery Detection, Real-time Classification, Flask Web Application, MongoDB, Content Authentication