VISTAS: REAL-TIME DEEPFAKE DETECTION USING MOBILENETV2 FOR AUTOMATED FACIAL FORENSICS

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ABSTRACT

The rapid rise of hyper-realistic synthetic media, commonly known as Deepfakes, has posed significant challenges to the integrity of digital content. Traditional verification methods relying on human visual inspection are increasingly inadequate, as Generative Adversarial Networks (GANs) can produce forgeries that are nearly indistinguishable from authentic images. Manual detection is time-consuming, error-prone, and insufficient to curb misinformation, identity theft, and cyber fraud. To address these issues, an automated and intelligent forensic system is required to ensure accurate and efficient media authentication.

This paper presents VISTAS (Visual Integrity Security & Tracking AI System)**,** a real-time deepfake detection framework that leverages deep learning techniques for facial forensic analysis. The system captures image inputs via a secure web interface, extracts subtle feature patterns, and compares them with trained neural network weights to classify images as authentic or manipulated. VISTAS uses the MobileNetV2 architecture, a high-efficiency Convolutional Neural Network (CNN) optimized for real-time performance on resource-constrained devices. The model is trained on a large dataset of authentic and synthetic facial images, enabling it to detect microscopic artifacts, hidden noise distributions, and structural inconsistencies left by AI-generated content.

Implemented with TensorFlow and OpenCV, the system provides a scalable and user-friendly solution for media organizations and cybersecurity agencies. By automating deepfake detection, VISTAS enhances digital trust, supports content verification, and mitigates the risks associated with AI-generated media in the modern digital landscape.

Keywords: Deepfake Detection, Facial Forensics, Artificial Intelligence (AI), Convolutional Neural Networks (CNN), MobileNetV2