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Deep Fake Video Detection

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Abstract: *Deep fake technology has rapidly evolved due to advances in deep learning, enabling the creation of highly realistic synthetic videos in which a person's face, voice, or expressions are manipulated. While these techniques can be used for entertainment and creative applications, they pose serious threats such as misinformation, identity fraud, political manipulation, and loss of public trust. Therefore, accurate and efficient deep fake video detection has become a critical research challenge. This study presents an analytical approach to detecting deep fake videos using machine learning and computer vision techniques. The proposed system focuses on extracting subtle inconsistencies in facial movements, lip-sync patterns, eye blinking rates, texture artifacts, and compression irregularities that commonly appear in manipulated footage. A combination of convolutional neural networks (CNNs) and feature-based analysis is employed to classify videos as real or fake. The system is trained on publicly available deep fake datasets to improve generalization and robustness against diverse manipulation methods. Experimental results indicate that the model achieves high accuracy and effectively identifies forged content even in complex scenarios. This research contributes to building secure digital environments by helping prevent the spread of harmful synthetic media. Future improvements may include real-time detection capability, multimodal analysis, and enhanced performance against next-generation deep fake generation techniques.*

Keywords*:* Deep Fake, Fake Video Detection, Deep Learning, Convolutional Neural Network (CNN), Face Manipulation, Synthetic Media, Computer Vision, Digital Forensics, Video Analysis, Misinformation, AI-generated Content, Feature Extraction, Fraud Prevention, Machine Learning, Forgery Detection

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