

Deepfake Detection Using Ensemble of MobileNetV2 and EfficientNetV2 with Grad-CAM Visualization

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Abstract: Deepfakes—AI-generated synthetic media—pose a growing threat to digital authenticity and personal privacy. This project presents a deepfake detection system that combines MobileNetV2 and EfficientNetV2B0 in an ensemble framework to improve detection accuracy and robustness. Grad-CAM visualizations enhance interpretability, showing the areas of focus in each prediction. The system is trained on a curated dataset of real and fake face images and deployed with a user-friendly Gradio interface for real-time detection. Results demonstrate high classification accuracy and explainable outputs, offering a practical solution to deepfake challenges.

Keywords: Deepfake Detection, MobileNetV2, EfficientNetV2B0, Grad-CAM, Ensemble Learning, CNN, Explainable AI, Face Image Classification, Transfer Learning, Gradio Interface

