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AI-Generated-Image Detection Using Deep Learning Techniques

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Abstract: *The rapid proliferation of AI-generated images poses significant challenges to digital media authenticity[1][2]. This research introduces a novel deep learning-based approach for detecting AI-generated images, leveraging an ensemble of transfer learning, ResNet50, and DenseNet architectures. By integrating a custom feature extraction method[3] that identifies artifact patterns commonly found in GAN-generated images, along with metadata analysis, our system achieves 94% accuracy in distinguishing real from AI-generated images. The proposed method demonstrates robust performance across multiple AI image generation models, including StyleGAN3, Stable Diffusion, and Midjourney[1][4], ensuring adaptability to evolving image synthesis techniques.*

Keywords: Deep Learning, Neural Networks, GAN Detection, Transfer Learning, ResNet50, DenseNet, Convolutional Neural Networks (CNN), Image Authenticity Detection.

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