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AI Assisted Image Colorizer

Prof. Vindya L[1], Bhanushree N[2], Kavyashree N[3], Nanditha K[4], Navya T[5]
Assistant Professor, Department of Information Science and Engineering[1]
U.G. Students, Department of Information Science and Engineering[2,3,4,5]
S J C Institute of Technology, Chickaballapura, Karnataka, India.
vindyal@sjcit.ac.in, bhanunagraj30@gmail.com, kavyashree3321@gmail.com
knanditha858@gmail.com, navyathimmarju@gmail.com

Abstract: *DeOldify is an advanced deep learning-based AI project designed for automatic colorization and restoration of grayscale images and videos. It utilizes Generative Adversarial Networks (GANs) and Convolutional Neural Networks (CNNs) to generate high- quality, realistic colorizations with minimal user input. A key innovation in DeOldify is the NoGAN training approach, which combines pre-trained neural networks with adversarial learning to improve color accuracy and detail preservation. The model leverages a pre-trained ResNet as a feature extractor, enhancing image sharpness and reducing artifacts. Additionally, a self-attention mechanism refines the distribution of colors, ensuring natural and contextually appropriate results. These advancements make DeOldify highly effective for restoring historical photographs, enhancing old film footage, and improving medical imaging visualization. AI-assisted colorization has broad applications, including the revival of vintage photos, artistic reinterpretation of monochrome imagery, and aiding medical diagnostics by improving grayscale scan contrast. However, challenges such as color ambiguity, hallucination of incorrect colors, and dependence on training datasets remain areas for improvement.*

Keywords: DeOldify, AI colorization, deep learning, GANs, NoGAN, image restoration, historical photo enhancement, CNNs, ResNet, digital image processing