

ABSTRACT

Images often suffer from visual degradation, such as scratches, which can reduce their quality and visual integrity, necessitating effective restoration methods. Conventional methods for removing scratches are often ineffective in handling complex and irregular noise. Therefore, this study proposes the use of Generative Adversarial Networks (GAN) for image restoration through the image inpainting technique. GAN is chosen for its ability to produce high-quality images by filling in missing or damaged areas based on the surrounding context. This study also compares the use of two normalization techniques, Batch Normalization and Instance Normalization, to improve the quality of the restored images. Experimental results show that Instance Normalization provides better performance in maintaining the quality of the generated images, with a PSNR value reaching **31.0108 dB** and MSE as low as **0.0035** on certain images, compared to PSNR **30.1147 dB** and MSE **0.0042** for Batch Normalization. Instance Normalization also produces more natural images with lower errors. These findings support the use of Instance Normalization in the GAN architecture for image inpainting tasks, offering a more effective solution for addressing the issue of scratches in images.

Keywords: *Image Restoration, Image Inpainting, Generative Adversarial Network, Batch Normalization, Instance Normalization.*