Research on Landscape Painting Colorization Based on Generative Adversarial Networks

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Landscape painting is a traditional Chinese painting art form with a long history and diverse styles. However, due to pigment technology, preservation conditions and other limitations, most of the landscape paintings that can be seen nowadays are monochrome wash drawings, while colorful landscape paintings may fade as time went by. In order to solve this problem, this research establishes a new landscape painting dataset LPD, in which 8467 colorful landscape painting images for training, 100 images of both colorful and wash landscape drawings for testing are collected. After cutting, normalization and grayscale processing for partial images, pairs of gray and colorful landscape painting samples are formed in the dataset. Meanwhile, this research uses the Generative Adversarial Networks (GAN) and pix2pix technology to colorize grayscale images. Resnet and Unet are applied to establish landscape painting colorization models, which are analyzed and compared afterwards. The results of quantitative analysis show that the method can generate aesthetically pleasing paintings with strong sense of reality and high degree of restoration. User survey show that it is difficult for human to distinguish real colorful landscape paintings from fake ones generated by the model. The model has various practical values in restoring color of faded landscape paintings and re-creation of famous landscape paintings.

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