

Image-to-Chinese Ink Painting Style Transfer Using CycleGAN

Question Description:

Chinese Ink painting is a unique art form characterized by its black and white brush strokes and emotional expression. However, creating Chinese ink paintings manually requires considerable artistic skill. This project aims to use CycleGAN to achieve automatic transformation of ordinary photographs into Chinese ink painting style images. Through Deep learning, we aim to preserve the artistic essence of Chinese ink painting while automating the style transfer process.

Dataset Describe:

In this study, the model utilizes four datasets: testA, testB, trainA, and trainB. Dataset A represents real landscape photos, while dataset B consists of Chinese ink paintings. The 'test' datasets (testA and testB) are used for model evaluation, while the 'train' datasets (trainA and trainB) are employed for model training. We have found available datasets containing both Chinese ink paintings and real landscape photos. From these datasets, we plan to select approximately 2000 Chinese ink paintings and 2000 real landscape photos for training and testing purposes.

Model Describe:

CycleGAN, or Cycle-Consistent Generative Adversarial Network, is a model for image style transfer that does not require paired datasets. Traditional models rely on paired images for training, but CycleGAN introduces cycle consistency loss, ensuring that an image translated to another domain and back retains its original content. This mechanism enables CycleGAN to learn mappings between domains in an unsupervised manner, making it widely applicable for tasks such as converting photographs into artistic styles like ink paintings.

Target Metrics:

The goal is achieving high quality transformations from ordinary photos to Chinese ink painting styles while preserving artistic details and visual appeal. This project mainly uses subjective assessment (judge the picture quality directly) and objective assessment methods (Fréchet Inception Distance, Learned Perceptual Image Patch Similarity, Structural Similarity).