High Resolution Image Generation Algorithm for Archaeology Drawings

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Abstract : Aiming at the problem of low accuracy and susceptibility to cultural relic diseases in the generation of high-resolution archaeology drawings by current image generation algorithms, an archaeology drawings generation algorithm based on a conditional generative adversarial network is proposed. An attention mechanism is added into the high-resolution image generation network as the backbone network, which enhances the line feature extraction capability and improves the accuracy of line drawing generation. A dual-branch parallel architecture consisting of two backbone networks is implemented, where the semantic translation branch extracts semantic features from orthophotographs of cultural relics, and the gradient screening branch extracts effective gradient features. Finally, the fusion fine-tuning module combines these two types of features to achieve the generation of high-quality and high-resolution archaeology drawings. Experimental results on the self-constructed archaeology drawings dataset of grotto temple statues show that the proposed algorithm outperforms current mainstream image generation algorithms in terms of pixel accuracy (PA), structural similarity (SSIM), and peak signal-to-noise ratio (PSNR) and can be used to assist in drawing archaeology drawings.

Keywords : archaeology drawings, digital heritage, image generation, deep learning
Conference Title : ICDH 2024 : International Conference on Digital Heritage
Conference Location : Rhodes, Greece
Conference Dates : July 18-19, 2024