Efficient Shadow Detection and Removal using Synthetic Data with Domain Adaptation

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Abstract: In recent years, learning based shadow detection and removal approaches have shown prospects and, in most cases, yielded state-of-the-art results. In this paper, we leverage on large high quality synthetic image database and domain adaptation to mitigate the bottlenecks resulting from insufficient training samples and domain bias. Specifically, our approach utilizes adversarial training to predict near-pixel-perfect shadow map from synthetic shadow image for downstreaming shadow removal steps. At inference time, we capitalize on domain adaptation via image style transfer to map the style of real-world scene to that of synthetic scene for the purpose of detecting and subsequently removing shadow. Comprehensive experiments indicate that our approach outperforms state-of-the-art methods on selected benchmark datasets.

Methodology: Cascaded Generative Adversarial Network (GAN)

Experiments and Results: