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Executive Summary

Dual Encoder-Decoder Attentive Generative Adversarial Network for Shadow Removal

Muneeb Abbasi

One of the biggest obstacles to performing various computer vision tasks, like object tracking and recognition, is the presence of shadows in images. To return darkened regions to shadow-free regions, numerous shadow removal techniques have been developed. The authors of this research provide a novel two-stage architecture to improve shadowed photos based on the Generative Adversarial Network (GAN). To use the contextual information of shaded regions, they first create an efficient attention mechanism in the generator. To make the generator pay more attention to shadows, a spatial variant loss is also computed using the attention map. Additionally, they use a perceptual loss at the feature level to restrict the output and the ground truth to make the generated image more similar.

The generator seeks to improve the input image by getting rid of shadows. Shadow detection and removal are the two distinct steps that make up the generative component. The shadow image is transformed into a clean image using the contextual encoder. The current techniques process both areas with and without shadows using the same network. However, the two places have distinct initial information. Therefore, treating the shadow zones and other regions equally is nonsensical. Four variations of our technique are developed to carry out diverse ablation investigations, demonstrating that each component of their network is essential.

They provide a brand-new two-stage generative adversarial system in their study for eliminating shadows. They create an attentive-recurrent network during the shadow detection phase to produce the visual attention map. Two auto-encoders are utilized in the shadow removal stage to process the shadowed regions and shadow-free regions separately to maintain consistency. To direct the generator's attention to shadows, the attention map is provided into the auto-encoders as a prior. They contrast their method with cutting-edge techniques to demonstrate its superiority on both a quantitative and qualitative level. Furthermore, many ablation experiments show the significance of each component of our approach. To eliminate shadows in difficult situations, the authors plan to gather more shadowed and shadow-free photos with more complex settings in the future.

Source: Information

KEYWORDS

Attention mechanism; dual encoder-decoder; shadow removal