**ABSTRACT**

Images captured under outdoor scenes usually suffer from low contrast and limited visibility due to suspended atmospheric particles, which directly affects the quality of photos. Despite numerous image-dehazing methods have been proposed, effective hazy image restoration remains a challenging problem.

Existing learning-based methods usually predict the medium transmission by Convolutional Neural Networks (CNNs), but ignore the key global atmospheric light. Different from previous learning-based methods, we propose a flexible cascaded CNN for single hazy image restoration, which considers the medium transmission and global atmospheric light jointly by two task-driven subnetworks. Specifically, the medium transmission estimation subnetwork is inspired by the densely connected CNN while the global atmospheric light estimation subnetwork is a lightweight CNN. Besides, these two subnetworks are cascaded by sharing the common features. Finally, with the estimated model parameters, the haze-free image is obtained by the atmospheric scattering model inversion, which achieves more accurate and effective restoration performance, Qualitatively and quantitatively experimental results on the synthetic and real-world hazy images demonstrate hat the proposed method effectively removes haze from such images, and outperforms several state-of-art dehazing methods.

**Keywords:** Image-dehazing, global atmospheric light, medium transmission, image restoration, convolutional neural networks