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Author: Wenfei Zhang Jian Liang Haijuan Ju Liyong Ren  
Enshi Qu Zhaoxin Wu



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## Study of visibility enhancement of hazy images based on dark channel prior in polarimetric imaging

Wenfei Zhang <sup>a,b,c</sup>, Jian Liang <sup>a,c</sup>, Haijuan Ju <sup>a,c</sup>, Liyong Ren <sup>a,\*</sup>, Enshi Qu<sup>a</sup>, Zhaoxin Wu<sup>b</sup>

<sup>a</sup>Research Department of Information Photonics, Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences, Xi'an 710119, China

<sup>b</sup>Department of Electronics Science and Technology, School of Electronic & Information Engineering, Xi'an Jiaotong University, Xi'an 710049, China

<sup>c</sup>University of Chinese Academy of Sciences, Beijing 100049, China

\*Corresponding author: Email: [renliy@opt.ac.cn](mailto:renliy@opt.ac.cn)

**Abstract:** During past decades, lots of efforts on image dehazing have been made based on either computer vision or physical models. In this paper, based on the combination of the polarimetric imaging and the dark channel prior techniques, we propose a novel haze-removal method. On the one hand, the former technique ensures this method has the advantage of keeping the detailed information which might be almost vanished in hazy images; on the other hand, the latter technique provides a much easier way to precisely estimate the key parameters, such as the global atmospheric light and the degree of polarization of the airlight. Moreover, in order to realize the automatically dehazing process with our method, a dynamic bias factor is creatively introduced into the dehazing process by use of the evaluation function—Entropy, ensuring excellent dehazed image being automatically obtained while not involving any other human-computer interaction. Experimental results indicate that our dehazing method can not only enhance the visibility of the hazy images effectively, but also preserve the details considerably. In addition, it is also found that this method is useful and effective for thin, medium and dense haze conditions, and thus shows a good robustness and universality.

**Keywords:** image enhancement; polarimetric imaging; scattering; visibility and imaging.

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