Image Dehazing using PCA Fusion Technique for Enhanced Road Visibility

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Authors:
Pranali U. Naik, Samarth Borkar

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Abstract

Presence of fog and haze significantly reduces the visibility of a scene. Better visibility is crucial for all computer vision applications thus recovering images impaired by haze or dehazing finds its application in the fields of surveillance, tracking, detection and restoration. In this paper a fusion based approach using principle component analysis (PCA) technique has been adopted. The novelty of this algorithm is that it does not require any haze depth generation as normally required in many existing methods. Using the original image two images are derived on these images contrast adjustment, and contrast normalization techniques are performed. PCA fusion improves fused image quality and resolution. This method only requires the original image and is simple and easy to implement. As the haze impaired image appears whitish and blurry the details of the road become less evident thus making driving in foggy weather conditions unsafe. Thus, the proposed method concentrates on dehazing for better road visibility. The qualitative and quantitative comparison as compared with existing color fidelity and contrast reveals that our proposed novel method is better at restoring color fidelity and enhancing contrast.
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References


Index Terms

Computer Science          Pattern Recognition

Keywords

Principle Component Analysis; Contrast normalization; Dehazing; Haze depth;