Skyless Dehazing

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Abstract

Turbidity problems caused by scattering such as in haze or water, can be eliminated by processing of several different pictures of the same scene taken under different ambient scattering conditions. For example, in haze these are different polarization states. From this image set, the scene is recovered as it would have looked like if there were no turbidity. In addition, the distance map of the scene is recovered as well. This reconstruction requires estimation of parameters of the ambient scattering. For example, in haze, these parameters are the polarization degree and the saturation value of the airlight.

In previous work these parameters were estimated using image pixels corresponding to objects that are effectively at an infinite distance from the camera. Nevertheless, the need to measure such objects limited the applicability of visibility recovery methods. In this work we present several alternative methods for estimation of the required parameters, without using samples from infinite distance objects. Therefore, the recovery methods have a wider applicability.