CV Assignment 3: Image Dehazing

Due Date: May 27, 2017

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1 Introduction

In this assignment, you will implement three approaches for image dehazing and compare the performance of different dehazing methods by using at least two evaluation measures.

The whole framework of the implementation for image dehazing is shown in Figure 1, it may serve as a reference for your assignment.

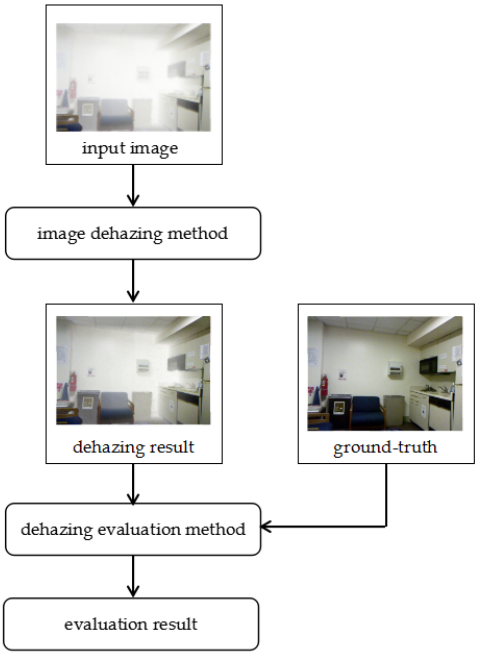

Figure 1: The framework of this assignment

To get started with the assignment, you will need to download the dataset from the attachment. The dataset contains 50 clear images and 50 synthetic hazy images. Use the whole synthetic hazy images for image dehazing.

The details of this assignment are given below in the following sections.

2 Image Dehazing

In this part, you will implement at least three image dehazing methods on all synthetic hazy images to get different dehazing results.

- Dark Channel Prior[1]
- Color Attenuation Prior[2]
- DehazeNet[3]
- Single Image Dehazing via MSCNN[4]
- Non-Local Image Dehazing[5]

3 Evaluation of Image Dehazing

In this part, you will compare the quality of image dehazing algorithms using at least two evaluation measures.

- Mean Squared Error (MSE)

[1]He, K., Sun, J., Tang, X. (2011). Single image haze removal using dark channel prior. IEEE Transactions on Pattern Analysis and Machine Intelligence, 33(12), 2341-2353.

[2]Zhu, Q., Mai, J., Shao, L. (2015). A fast single image haze removal algorithm using color attenuation prior. IEEE Transactions on Image Processing, 24(11), 3522-3533.

[3]Cai, B., Xu, X., Jia, K., Qing, C., Tao, D. (2016). Dehazenet: An end-to-end system for single image haze removal. IEEE Transactions on Image Processing, 25(11), 5187-5198.

[4]Ren, W., Liu, S., Zhang, H., Pan, J., Cao, X., Yang, M. H. (2016). Single image dehazing via multi-scale convolutional neural networks. In Proceedings of the 14th European Conference on Computer Vision. (pp. 154-169).

[5]Berman, D., Avidan, S. (2016). Non-local image dehazing. In Proceedings of the 29th IEEE Conference on Computer Vision and Pattern Recognition. (pp. 1674-1682).

- Peak Signal to Noise Ratio (PSNR)
- Structural Similarity index (SSIM)

Compare all dehazing algorithms on each evaluation measure you selected.

4 Analysis of Image Dehazing Methods and Results

In this part, you will explain the principle of image dehazing methods that you selected and analyze the results that you get.

5 Submission

1. Your code.
2. Your results.
3. A report with your methods and results of explanation and analysis.

Zip all your files and submit your assignment to ouceecv@163.com with the subject: YourName_Assignment3.zip. The name of your zip file should be the same as the email subject.