2021-2022 Fall, CS270 Digital Image Processing
School of Information Science and Technology
ShanghaiTech University

Project 2: Image Defogging

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1 Background

Images of outdoor scenes are usually degraded by the turbid medium (e.g., particles and water droplets) in the atmosphere. Haze, fog, and smoke are such phenomena due to atmospheric absorption and scattering. Defogging is an important way to improve the quality of outdoor images.

2 Goal

In this project, you will implement an algorithm that removes the fog in the images given by us. Your process on the image is not limited. As long as your results are reasonable, you will get **most** of the score for the coding part. And if you fully achieve the effect of the reference images given below, you will get **full** marks for the coding part.

The examples of image defogging are as follows:

(a) original image (b) Processed image

Figure 1: Examples of image defogging

(a) original image (b) Processed image

Figure 2: Examples of image defogging

We will provide two images named 'city_fog.png' and 'square_fog.jpg' and you need to implement the defogging algorithm and produce a comparable result. Please try to achieve the best defogging effect.

3 Hint

You **may** use the algorithm in this paper:

Kaiming He, Jian Sun and Xiaoou Tang, "Single image haze removal using dark channel prior," 2009 IEEE Conference on Computer Vision and Pattern Recognition, 2009, pp. 1956-1963.

4 Evaluation

(a) The code of your project: 15%. Please ensure that your code can be run without any modification by TAs. Your code should provide the same results as in your report.

(b) The report of this project: 20%. You should complete your project report with template we provided. The report should contain at least these parts: a brief introduction of your project, the description of your algorithm, the results of your code, and discussion of your results.

(c) The presentation of your project: 5%. There will be a short presentation for about three to five minutes and please prepare for it.

Please state your workload **in detail** both in the report and in the presentation. Workload is one of the important criteria for our scoring.

5 Policy on plagiarism

This is an individual homework. While you may discuss the ideas and algorithms, at **NO** time may you read, possess, or submit the solution code of anyone else (including people outside this course), or allow anyone else to read or possess your source code. We will detect plagiarism using automated tools and any violations will result a zero score for this assignment.