Digital Image Processing (2016)

Homework 4

[Image restoration]

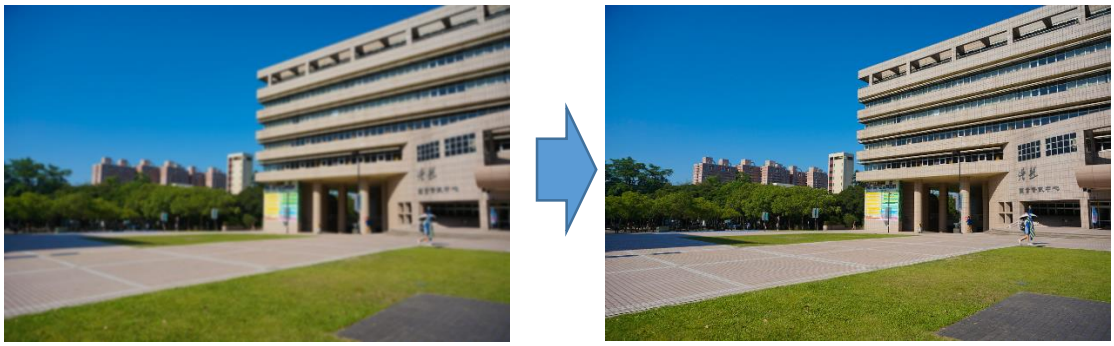
Deadline:2016.12.1

Image restoration (100%)

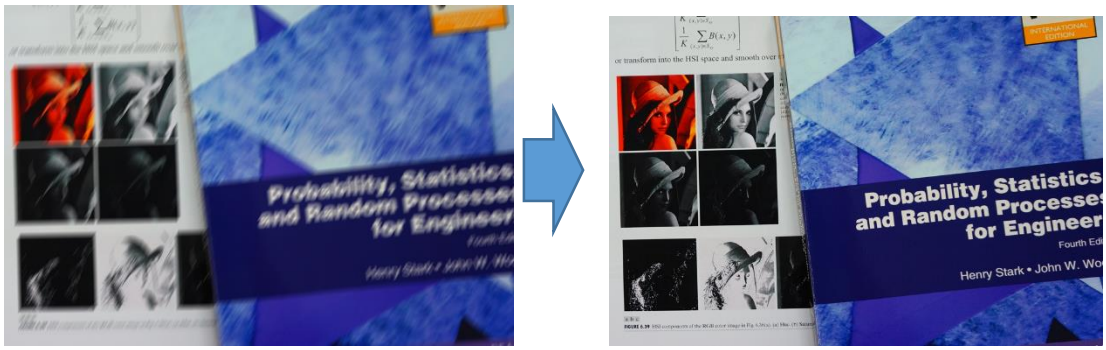
Using C++,C or matlab to restore the image below, and use the PSNR(see below) to evaluate your result based on the original pictures.

Do Not use any toolbox of the technique mentioned in this chapter.

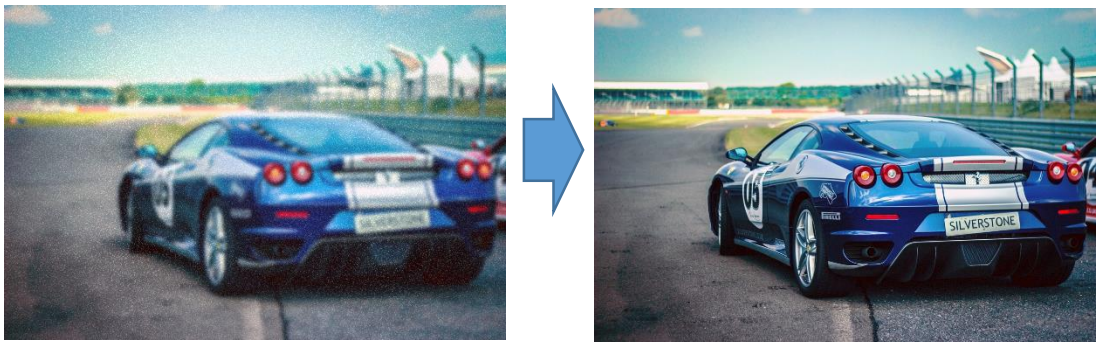
- Gaussian Blur (input1.bmp → output1.bmp)



- Motion blur (input2.bmp → output2.bmp)



- Gaussian Blur + Noise (input3.bmp → output3.bmp)



(Source: https://www.pexels.com/photo/road-blue-car-vehicle-50704/)

The performance will be evaluated by your PSNR based on the original picture, just try your best to recover it and make a specific discussion.

[Input]	input1.bmp	input2.bmp	input3.bmp
[Output]	output1.bmp	output2.bmp	output3.bmp
[Origin]	input1_ori.bmp	input2_ori.bmp	input3_ori.bmp

Demo: No demo, the result will be evaluated by the output file you submit.
Report: Do some discussion and explain your analyzation of the picture and your method in no more than 6 pages(A4). Mind that the original picture can be used only for evaluation.

- PSNR

$$\text{PSNR} = \sum_{k=R,G,B} 10\log_{10}\left(\frac{255^2}{MSE_k}\right)$$

where (C is the picture)

$$MSE_k = \frac{1}{mn}\sum_{i=0}^{m-1}\sum_{j=0}^{n-1}\left\|C_{k,output}(i,j) - C_{k,origin}(i,j)\right\|^2 \quad , \quad k = R\,,G\,,B$$

And compare the performance of your methods. **The original pictures can be used only for computing PSNRs.**

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Homework Rules and Grading Policy

Homework will be graded by:

1. Correctness.
2. Algorithm description
3. Discussion

Upload:

[FTP] 140.113.238.220
[Port] 634
[Username] DIP2016
[Password] DIP2016
[File Name] hw4_StudentId.zip (ex. hw4_1234567.zip)
hw4_StudentId_v2.zip

Remind:

1. Your C or C++ or matlab code with comments
2. Your report in the format of .pdf
3. ReadMe.txt file which describes how to run your program
4. Hand in a hard-copy of your report in the class on the due date
5. Deadline

   If you have a late submission by 1 to 7 days, you will only get 70% of the score.

   We DO NOT accept any late submission after 7 days after the deadline.