EE 663000 Digital Image Processing HW2

TA: Wengtai Su, Kangyu Liu, Chaoyi Peng
wengtai2008@hotmail.com
asdfghj49888@gmail.com
sky135410@yahoo.com.tw

1. Introduction

The programming language that can be used on this assignment includes but not limit to: C/C++/C# or .NET framework based programming language, Matlab, Python, PHP, Java, Javascript, Perl, and ASP/ASP.NET.

Note:

① Any existing filter function (API) is NOT allowed to use.

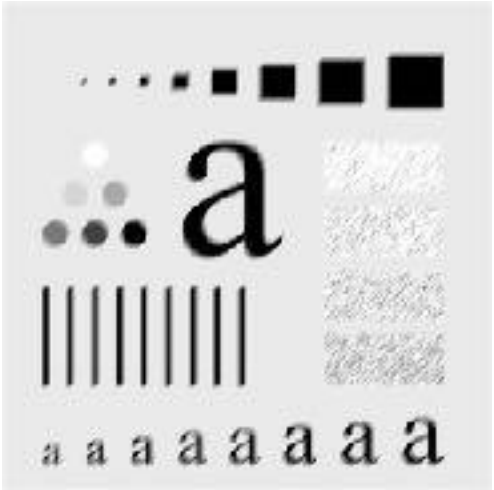
② You may use built-in functions or libraries to do tasks like Fourier transform, read images, etc.

③ Writing your own code for Fourier transform will grant you extra points.

2. Problems

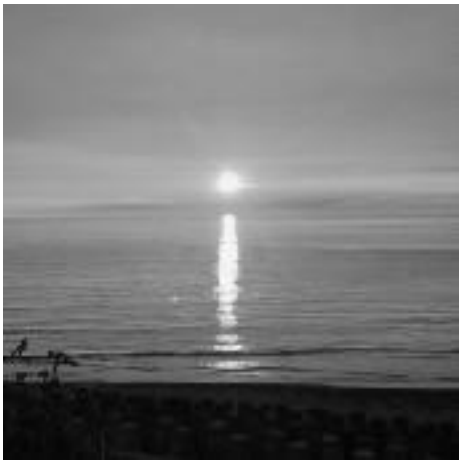
A. Image Restoration

(a) Given following two blurred images, use the wiener filtering to deblur the images. Try out different parameters and give your best result.



(b) Given the following noised image, observe the frequency spectrum, and design a notch filter to denoise the image.

(c) Given the following noised image, observe the frequency spectrum, and design a band reject filter to denoise the image.



(d) Discuss the parameters you choose and any technics you utilize.

B. Homomorphic filtering

(a) Given the image, apply following filters to enhance the image in Frequency domain. Then, recover these images from frequency domain to spatial domain.

1. Ideal highpass filter
2. Butterworth highpass filter
3. Gaussian highpass filter

(b) Discuss their characteristics.

3. Upload file

The code, test data and report should be all compressed into a ZIP file **(accept .zip file only)** and upload to iLMS website. The report format can be found in [1]. It may include Introduction, Method, Experiments, and Conclusion Sessions. Also, please do write a Readme file to explain how to run your code as details as you can.

4. Criterion

Completeness of code: 65% (Comments for code, executable, exception processing...etc.)
Report (in word or LaTex): 25% (Your thoughts, report format, and analysis on the each assignment)

Interface of code: 10%

Bonus: 5% (Extra experiments)

Reference

[1] IEEE Manuscript Templates,

http://www.ieee.org/conferences_events/conferences/publishing/templates.html