Thierry Cantenot

Report

Digital Image Processing

« Assignments »

2014-2015

Summary

A. Histogram Equalization

A.1 Problem statement

1. Write a computer program for computing the histogram of an image.
2. Implement the histogram equalization technique.
3. Your program must be general to allow any gray-level image as its input.

A.2 Python program

Usage : **python problem1.py [-h] image_path**

A.3 Figure 1

A.3.1 Histogram

Original image : A.1 | Original image's histogram : A.2

A.3.2 Histogram equalization

Enhanced image : A.3 | Enhanced image's histogram : A.4

A.4 Figure 2

A.4.1 Histogram

Original image : A.5 | Original image's histogram : A.6

A.4.2 Histogram equalization

Enhanced image : A.7 | Enhanced image's histogram : A.8

FIGURE A.1 – Original *Fig1.jpg*

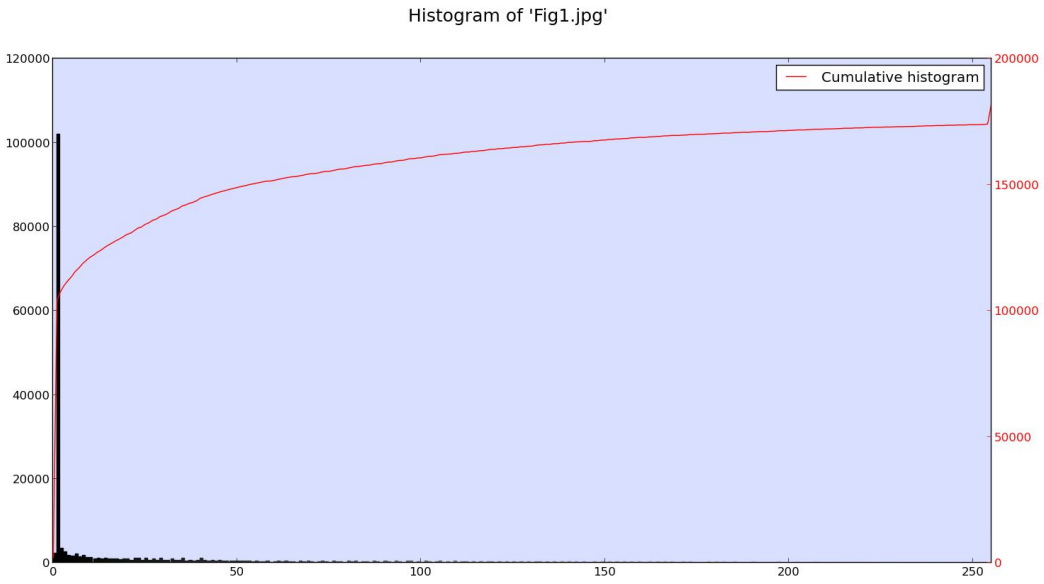

FIGURE A.2 – Histogram of *Fig1.jpg*

FIGURE A.3 – Enhanced *Fig1.jpg*

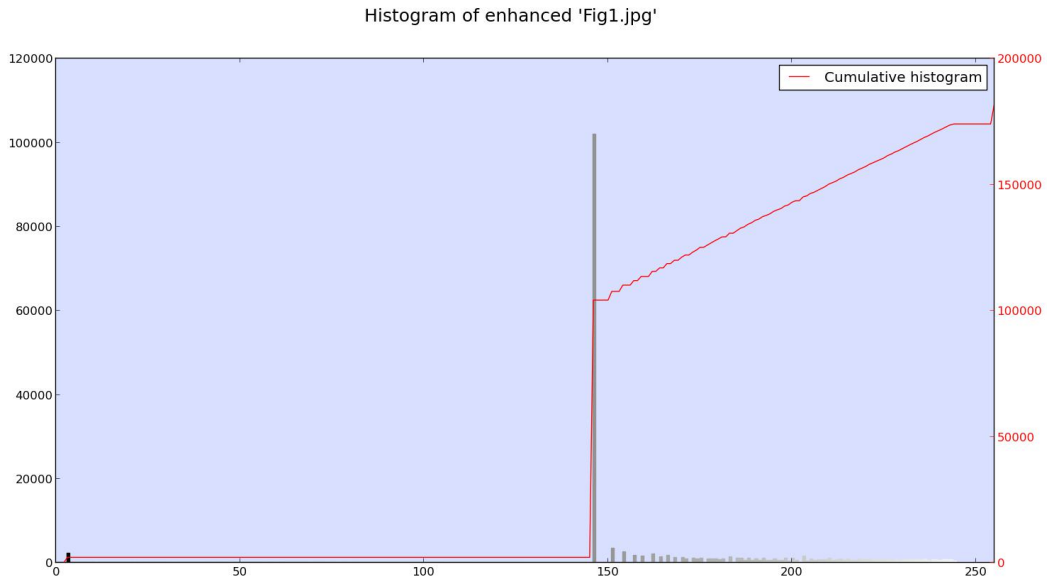

FIGURE A.4 – Equalized histogram of *Fig1.jpg*

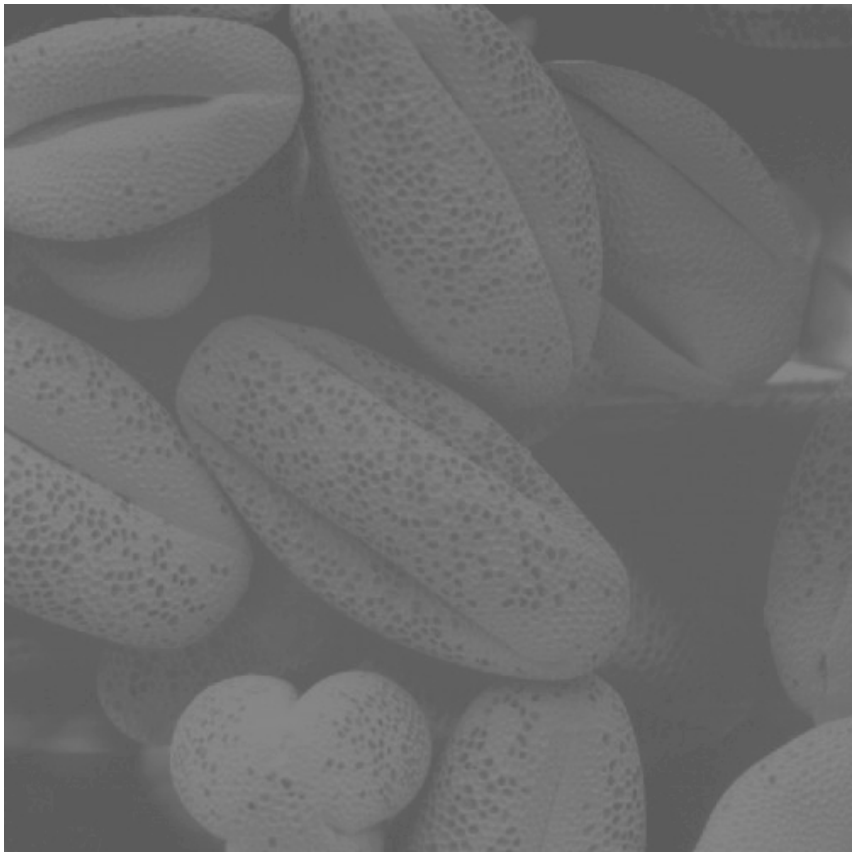

FIGURE A.5 – Original *Fig2.jpg*

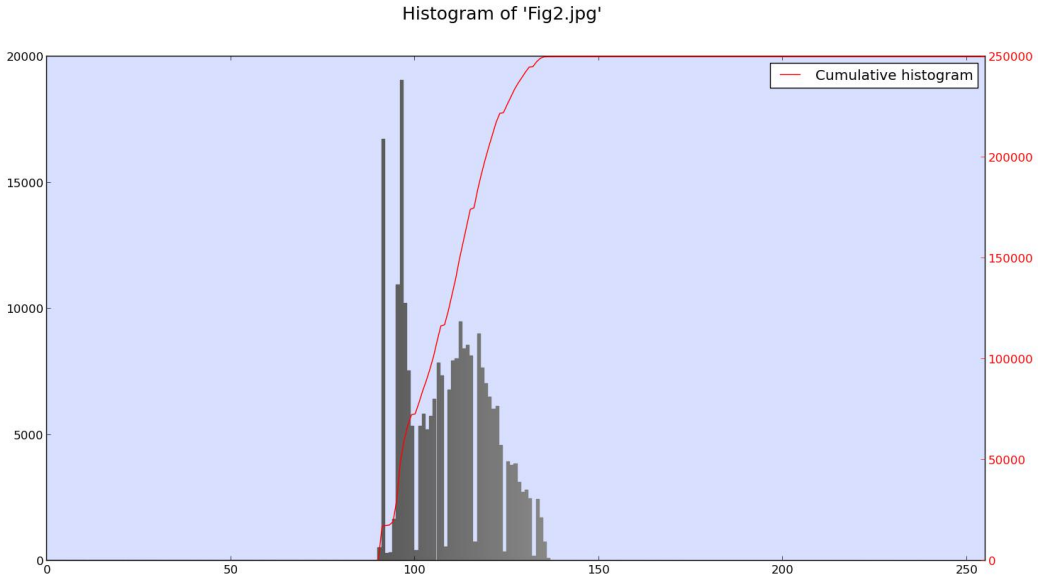

FIGURE A.6 – Histogram of *Fig2.jpg*

FIGURE A.7 – Enhanced *Fig2.jpg*

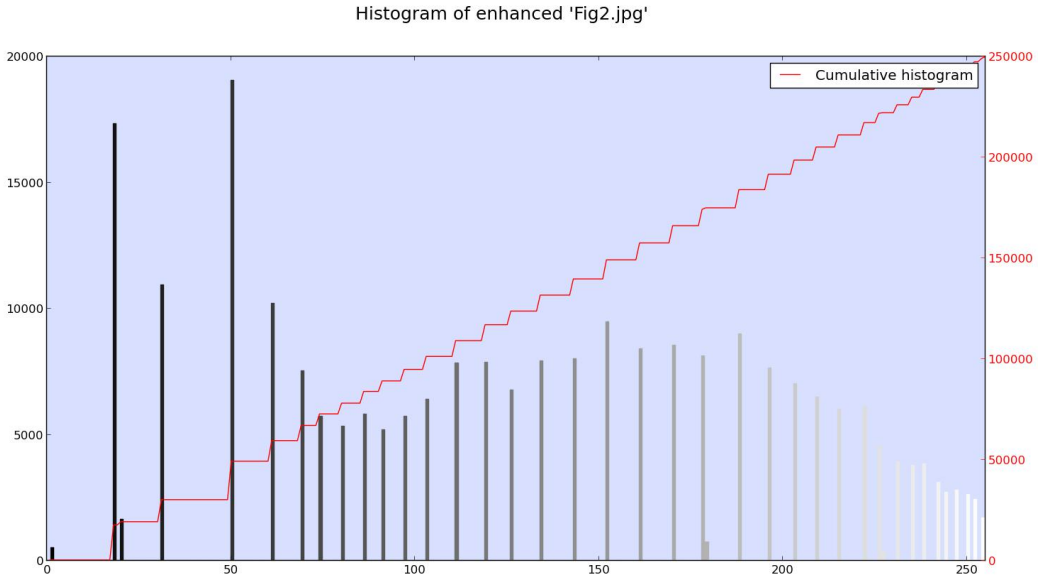

FIGURE A.8 – Equalized histogram of *Fig2.jpg*

B. Combining spatial enhancement methods

B.1 Problem statement

Implement the image enhancement task of Section 3.7 (Fig 3.43) (Section 3.8, Fig 3.46 in our slides).
The image to be enhanced is *skeleton_ orig.tif*.
You should implement all steps in Figure 3.43.
(You cannot directly use functions of Matlab such as imfilter or fspecial, implement all functions by yourself).

B.2 Python program

Usage : **python problem2.py [-h] [–laplacian] [–sobel] [-a A] image_path**

B.3 Figure 2