DIP Homework #1

Due Date: **Apr. 8 (Monday), 18:00**

There are three problems for this assignment:

Problem 1 (**required for every student**): Error Diffusion

original image

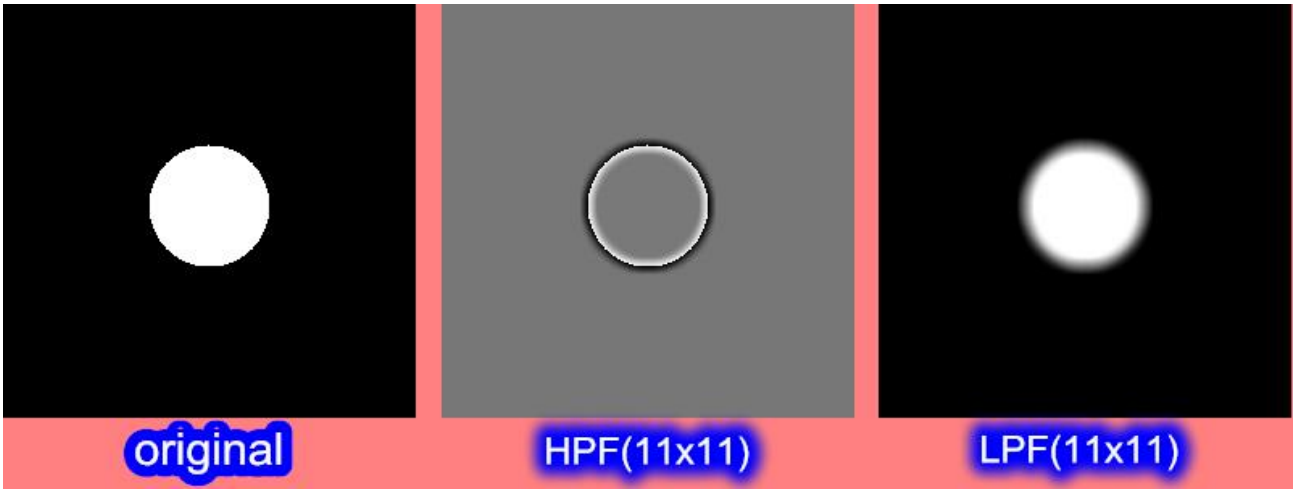
呂昭穎提供 processed by error-diffusion

original

processed

Problem 2: You have the options to choose one (**just one is needed**) from the following problems:

(1) lowpass filtering
(2) directional smoothing
(3) median filtering
(4) adaptive smoothing
(5) variance-adaptive filtering
(6) adaptive median filtering
(7) highpass filtering
(8) fun with colors (e.g., color modification, pseudo-coloring, etc.)



(Here the highpassed result is linearly scaled.)

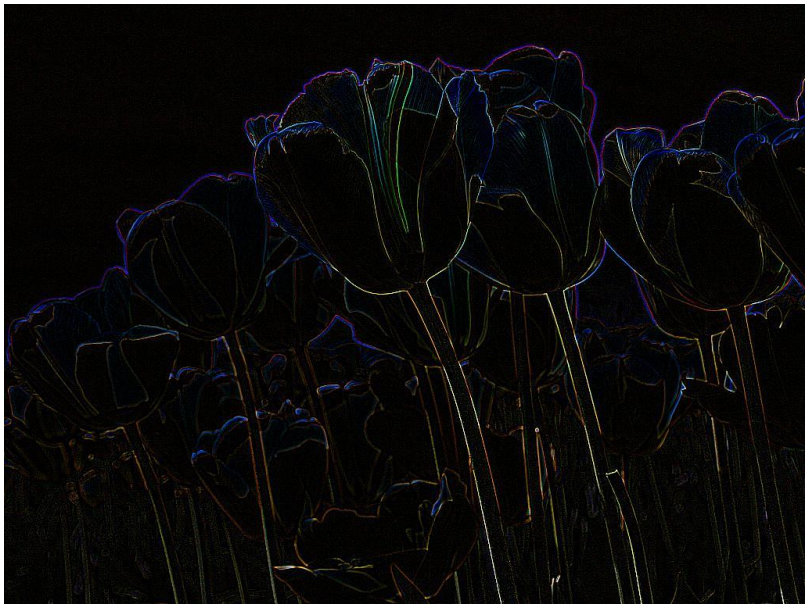
原圖:(9X9)

結果圖:

an example of lowpass-filtering (林敬侑提供)

Examples of Highpass Filtering

original image (tulip)



highpass-filtered image (tulip)

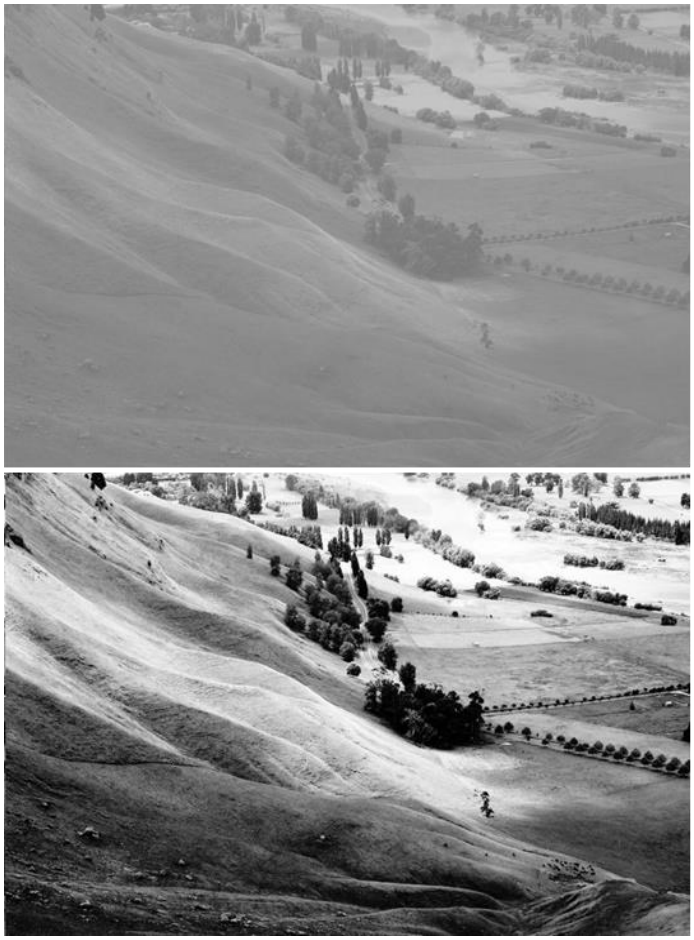
original image (penguin)

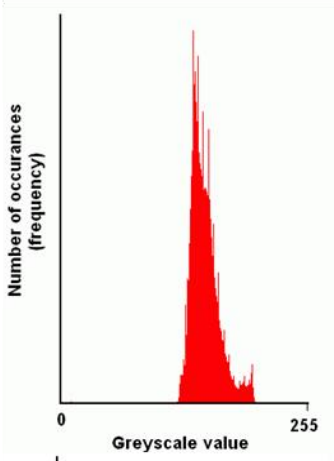
highpass-filtered image (penguin)

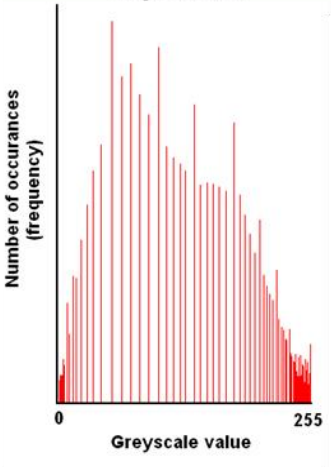
Problem 3: You have the options to choose one (**just one is needed**) from the following problems:

(1) histogram equalization

Use **boat.bmp** as a test image. Of course you can also use other images that can exhibit the effect of histogram equalization clearly.







(2) edge sharpening

original image 張宏銘提供 edge-sharpened image

Notes:

- For the median filtering problem, use the attached image (**lena_noisy_pepper&salt.bmp**) as the input test file.
- For all other problems, you can use your own images. Either gray-scale or full-colored images are acceptable. I would suggest that you try some colorful pictures which may look more interesting.
- Pay attention to the out-of-range problem in displaying the HPF result. You can employ any of the techniques discussed in class. In the figure shown on the previous page, the highpass-filtered image is displayed after applying linear scaling of the gray levels.
- Note that in the package I forward to each of you, it includes main.cpp, bmp.cpp, bmp.h, two test images (lena_noisy_pepper&salt, boat.bmp), a sample report "(報告範例)u9713151 李柏勳_HW5", DIP 作業上傳須知.doc, and this readme file.