

Assignment

Please use the octagonal 3-5-5-3 kernel. (which is actually taking the local maxima or local minima respectively).

4 images should be included in your report: Dilation, Erosion, Opening and Closing.

Introduction

B06507002_HW5_ver1.zip contains

1. HW5_B06507002.pdf
2. HW5_B06507002.py

where 1. is the report and 2. is my source code.

One can reproduce this assignment by putting "lena.bmp" and "HW5_B06507002.py" in the same folder and running "HW5_B06507002.py". Then, four image data: "lena_d.bmp", "lena_e.bmp", "lena_o.bmp", "lena_c.bmp" can be dumped in the same folder, where d stands for dilation, e stands for erosion, o stands for open, c stands for close.

Original Lena



Original Lena

Results



Left: Lena after dilation/Right: Lena after erosion



Left: Lena after opening/Right: Lena after closing

- I pad zeros at the border as my homework's boundary condition.
- I write the 3-5-5-5-3 kernel as a 5*5 matrix centered at (2,2), whose entry is 1 if there is an element and else is 0.
- In the dilation and the erosion function, I move the kernel on each position in the origin image. By using the logic taught in class, I produce the expected image. For dilation, I operate the kernel with the specific location of the image, and then find the maximum. For erosion, I find the minimum instead.
- After the dilation and the erosion function, I can combine the two function to produce the function of opening and closing.