Computer Vision Homework 4 Report B06507002 材料三 林柏勳

Assignment

Binarize Lena with the threshold 128 (0-127,128-255).
Please use the octogonal 3-5-5-5-3 kernel.
Please use the "L" shaped kernel (same as the text book) to detect the upper-right corner for hit-and-miss transform.
Please process the white pixels (operating on white pixels).
5 images should be included in your report: Dilation, Erosion, Opening, Closing, and Hit-and-Miss.

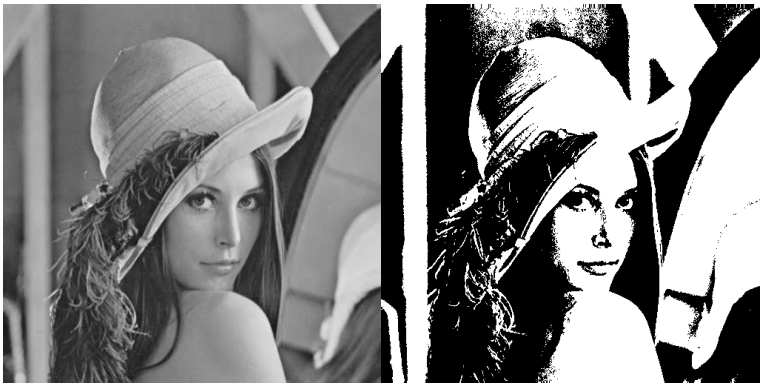
Introduction

B06507002_HW4_ver1.zip contains

1. HW4_B06507002.pdf
2. HW4_B06507002.py

where 1. is the report and 2. is my source code.
One can reproduce this assignment by putting “lena.bmp” and “HW4_B06507002.py” in the same folder and running “HW4_B06507002.py”. Then, six image data: “lena_t.bmp”, “lena_d.bmp”, “lena_e.bmp”, “lena_o.bmp”, “lena_c.bmp”, “lena_h.bmp” can be dumped in the same folder,
where t stands for binarized(thresholding 128) , d stands for dilation, e stands for erosion, o stands for open, c stands for close, h stands for hit and miss.

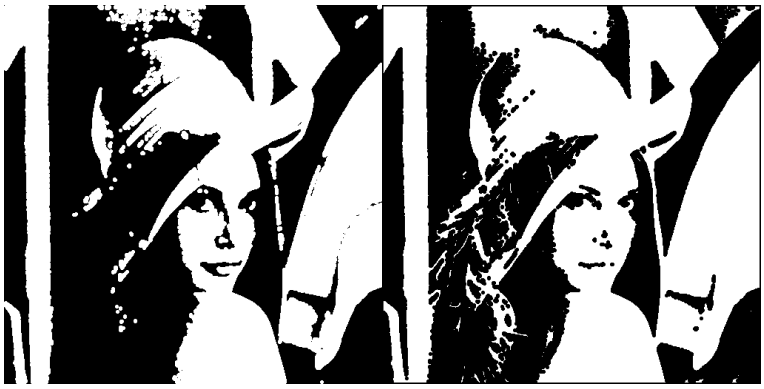
Original Lena vs Binarized Lena



Left: original Lena / Right: binarized Lena

Results

Left: Lena after dilation/ Right: Lena after Erosion



Left: Lena after opening/ Right: Lena after closing

Lena after hit-and-miss

- 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.
- After the dilation and the erosion function, I can combine the two function to produce the function of opening and closing.
- In hit and miss function, I write the two kernels as 3*3 matrixes centered at

(1,1), whose entry is 1 if there is an element and else is 0.
Then, I use the definition of hit-and-miss and the previous erosion function to create the result of hit-and-miss.