Computer Engineering Department

Faculty of Engineering, Mahidol University

LAB09: Morphological Image Processing

Objectives

Upon completion of this lab, you will be able to:

1. Understand the concept of morphological image processing.
2. Write an user-defined function in MATLAB to performs the morphological image processing on the grayscale image, including dilation, erosion, opening and closing.

Exercises

Note that you should create your own function in MATLAB as MATLAB User-defined function. It means that you cannot call MATLAB built-in function, which generates output in the same manner as your own function. You can use the images provided in the folder **\Google Drive\EGCO486_60-1\LABs\LAB09** for your exercises.

1) Morphological image processing using dilation

1.1 Write the user-defined function in MATLAB to perform morphological image processing on the input image using erosion with the 3×3 structuring element, having [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Myerosion.m. When this program is used with the image "text_image.tif" result as shown in Figure 1.

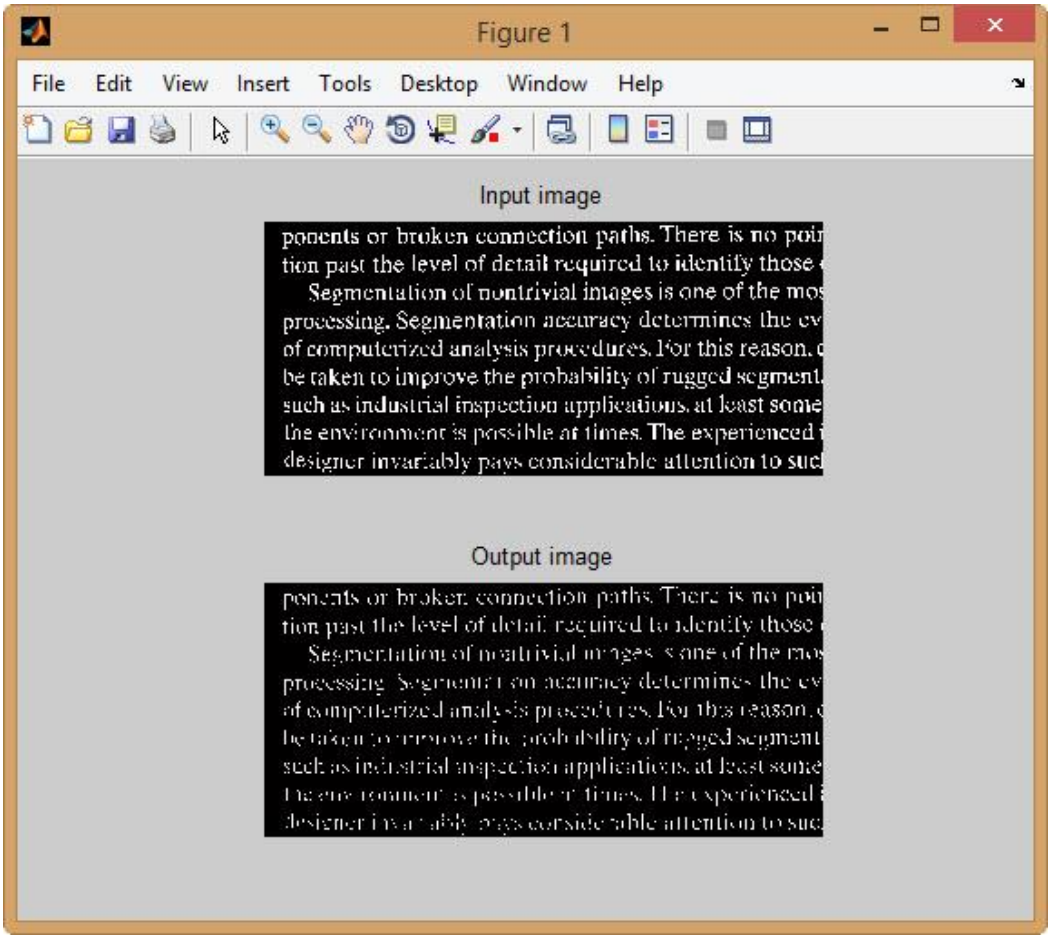

Figure 1: The result image of applying the morphological image processing on the input image by using erosion.

2) Morphological image processing using erosion

2.1 Write the user-defined function in MATLAB to perform morphological image processing on the input image using dilation with a 3×3 structuring element. The structuring element (SE) is [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Mydilate.m. When this program is used with the image "text-gaps_1_pixel.tif" result as shown in Figure 2.

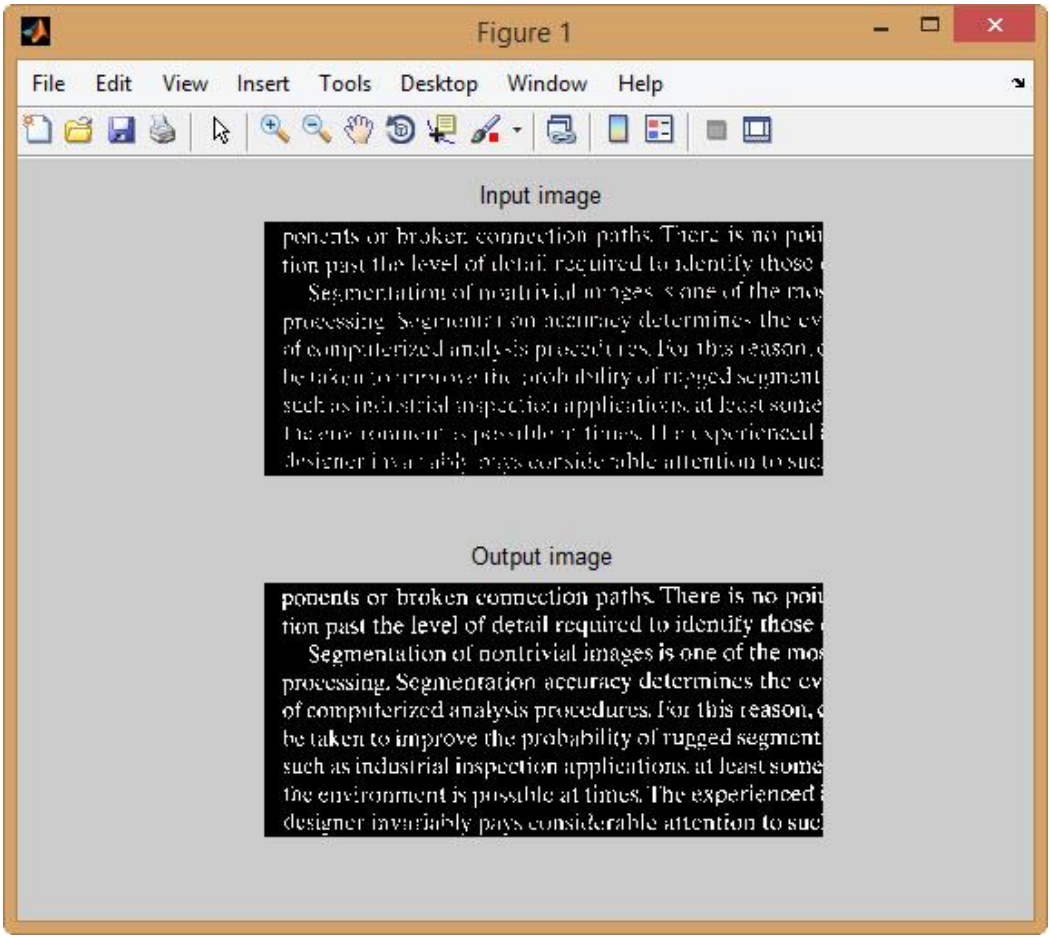

Figure 2: The result image of applying the morphological image processing on the input image by using dilation.

3) Morphological image processing using opening

3.1 Write a program in MATLAB to perform morphological image processing on the input image using opening with the 3×3 structuring element, having [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Myopening.m. When this program is used with the image "noisy_fingerprint.tif" result as shown in Figure 3.

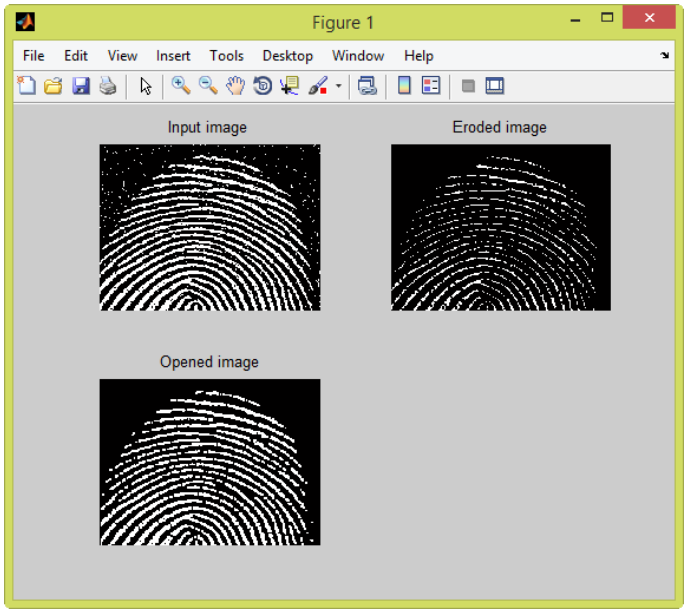

Figure 3: The result image of applying the morphological image processing on the input image by using opening.

4) Morphological image processing using closing

4.1 Write the program in MATLAB to perform morphological image processing on the input image using closing with the 3×3 structuring element, having [1 1 1; 1 1 1; 1 1 1]. Take the following program name: Myclosing.m. When this program is used with the image "noisy_fingerprint.tif" result as shown in Figure 4.

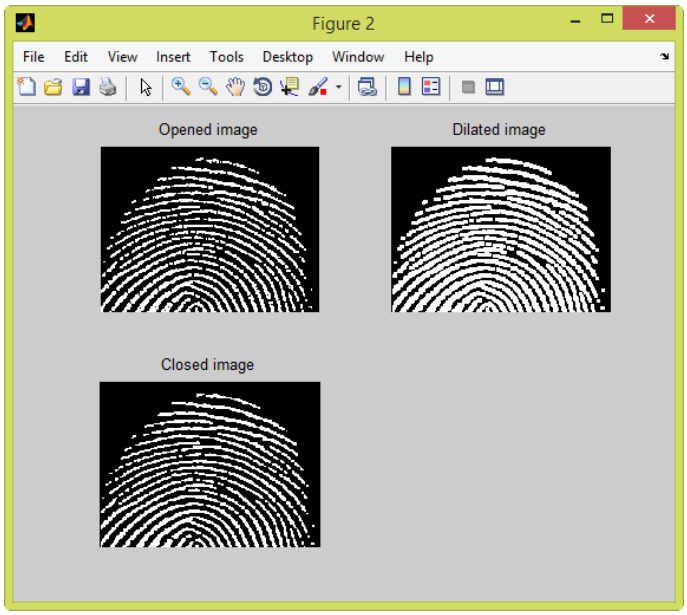

Figure 4: The result image of applying the morphological image processing on the input image by using closing.

What you need to submit:

Prepare a zip file that contains all matlab files (m-file extension). Email the zip file to the account **send2narit@hotmail.com** with the following subject line: **EGCO486_LABxx_yyy**, which xx is a number of LAB and yyy is the last 3 digits of the student identification number. Your email should reach us before Tuesday 11:59 PM.