

EE 146 COMPUTER VISION

Department of Electrical & Computer Engineering
University of California at Riverside
Tues., Thurs. 3:30 - 4:50pm, Online Class, Winter Quarter 2022
Labs Wed 8:00 --10:50am, Online; Thurs. 11:00 -- 1:50pm, Online

EE 146 Lab 3, January 19 & 20, 2022

Goal: Become familiar with binary image processing. In particular understand binary image morphology and connected component labeling algorithms and the properties of blobs.

Problem 1: Binary Image Morphology (Chap 9)

- 1) Download binary images from the website.
- 2) Using various structuring elements (of various shapes and sizes) perform morphological operations -- dilation, erosion, closing and opening to the images.
- 3) Submit the resulting images.

Problem 2: Connected components labeling and region properties (Chap 10)

Understand and implement connected component labeling algorithm 10.2; Test your program on two simple data sets.

```
Im = [0 0 1 0 0 1 1 1;  
      0 1 1 1 1 1 1 1;  
      1 1 1 1 1 1 1 1;  
      1 1 1 1 1 1 1 1;  
      1 1 1 1 0 0 1 1;  
      1 1 1 0 0 0 0 0;  
      1 1 1 0 0 1 1 1;  
      1 1 1 0 0 1 1 1];
```

```
Im = [1 1 0 1 1 1 0 1;  
      1 0 1 0 1 0 1;  
      1 1 1 1 0 0 0 1;  
      0 0 0 0 0 0 0 1;  
      1 1 1 1 0 1 0 1;  
      0 0 0 1 0 1 0 1;  
      1 1 0 1 0 0 0 1;  
      1 1 0 1 0 1 1 1];
```

Submit the labeling results after first pass and second pass.

After your program works, do the following:

- 1) Download a binary image from the website.
- 2) Find the connected components in the image and report four properties of components: area, centroid, perimeter, and circularity for each component.