Matlab和数字图像处理

实验内容

- **图像形态学滤波**
  - 基于形态学处理
  - 连通分量提取

1.形态学处理基本运算

1.定义结构元素
SE= strel(shape, parameters)
se=strel('diamond',5)
2.腐蚀、膨胀、开、闭运算
  (a) imerode(IM,SE)
  (b) imdilate(IM,SE)
  (c) imopen(IM,SE)
  (d) imclose(IM,SE)

SE = strel(shape, parameters)

E = strel(*shape*, parameters) creates a structuring element, SE, of the type specified by shape. This table lists all the supported shapes. Depending on shape, strel can take additional parameters. See the syntax descriptions that follow for details about creating each type of structuring element.

Flat Structuring Elements	
'arbitrary'	'pair'
'diamond'	'periodicline'
'disk'	'rectangle'
'line'	'square'
'octagon'	

Nonflat Structuring Elements	
'arbitrary'	'ball'

2. 形态学处理应用

2. 形态学处理应用

1.连通分量提取

2 .形态学应用-得到二值图像-图像分割

- % Convert image to binary image, based on threshold

- BW = im2bw(I, level)

- I:input image

- level: threshold

- converts the grayscale image I to a binary image.

- The output image BW replaces all pixels in the input image with luminance greater than level with the value 1 (white) and replaces all other pixels with the value 0 (black).

2.形态学处理应用

1.连通分量提取

CC = bwconncomp(BW) 返回在二值图像 BW 中找到的连通分量 CC

The output cc is a structure with information about each object;

"Connectivity"
The connectivity used in the boundary tracing. This may be different from the input argument, e.g., if conn is defined as a matrix of 1s and size 3x3, the "Connectivity" value will still be 8.

"ImageSize"
The size of the matrix bw.

"NumObjects"
The number of objects in the image bw.

"PixelIdxList"
A cell array with linear indices for each element of each object in bw A cell array containing where each element corresponds to an object in BW. Each element is represented as a vector of linear indices of the boundary of the given object.

Element connectivity conn, to define the size of objects, can be specified with a numeric scalar (number of elements in the neighborhood):

2.形态学处理应用

1.连通分量提取
%bwlabel对二维二值图像中的连通分量进行标注

[L, num] = bwlabel(BW, conn)

%其中 conn 指定连通性。如4连通、8连通

%L 返回标签矩阵，

%num即在 BW 中找到的连通对象的数量。

2.形态学处理应用

1.连通分量提取

%作用：删除二值图像BW中面积小于P的对象，默认情况下使用8邻域

BW2 = bwareaopen(BW, P)

Removes from a binary image all connected components (objects) that have fewer than P pixels, producing another binary image

2.形态学处理应用

图像分割
im2bw

形态学处理

伪彩色增强

Imshow(X,map)

'colormap' uses this to set the figure's colormap property.

Use this parameter to view grayscale images in false color.

help imshow

Help colormap

伪彩色增强