Computer Vision Homework 7 Report B06507002 材料三 林柏勳

Assignment

1. Binarize the benchmark image Lena as in HW2 by 128
2. Conduct thinning operation on the image.

Introduction

B06507002_HW7_ver1.zip contains

1. HW7_B06507002.pdf
2. HW7_B06507002.py

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

One can reproduce this assignment by putting “lena.bmp” and “HW7_B06507002.py” in the same folder and running “HW7_B06507002.py”. Then, “lena_threshold_downsample.bmp” and “lena_thinning.bmp” will be dumped.

Original Lena

Original Lena

Result

I use python 3 as my programming language, where I import numpy, opencv to do matrix calculation and image IO.

Since binarization and downsample part is the same as hw6, I will only talk about how the thinning operator works.

Lena after thresholding and downsampling / Lena after thinning

Thinning operator is a combination of three functions

Yokoi operator, Pair Relationship operator, Connected Shrink operator.

1. First conduct Yokoi operator as the same in hw6
2. For every pixel,

   if Yokoi(pixel)=1, then check its 4-connected neighbors,

if any of Yokoi(neighbor)=1 then mark this pixel.

3. Scan every pixel in the image from left to right, then from top to down,
   If Yokoi(pixel)=1 and the pixel is marked, then change the pixel's value to 0
4. Conduct 1-3 until the image doesn't change anymore.