CS415 HW2 Report

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图示

描述已自动生成Here is the input image:女人戴着帽子

描述已自动生成

The output images:

Kernel size = 3

日历

描述已自动生成图片包含 图形用户界面

描述已自动生成图片包含 图表

描述已自动生成图形用户界面, 应用程序

描述已自动生成图示

描述已自动生成图示

描述已自动生成Strong edge ratio : Weak edge ratio = 0.3 : 0.1:

图片包含 图形用户界面

描述已自动生成图形用户界面, 应用程序

描述已自动生成Kernel size = 3

图示

描述已自动生成Strong edge ratio : Weak edge ratio = 0.03 : 0.01:日历

描述已自动生成图片包含 图表

描述已自动生成图片包含 图形用户界面

描述已自动生成

图示

描述已自动生成图示

描述已自动生成Kernel size = 6

图片包含 日历

描述已自动生成图片包含 图表

描述已自动生成图形用户界面, 应用程序

描述已自动生成图片包含 图形用户界面

描述已自动生成Strong edge ratio : Weak edge ratio = 0.3 : 0.1:

图片包含 图示

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描述已自动生成

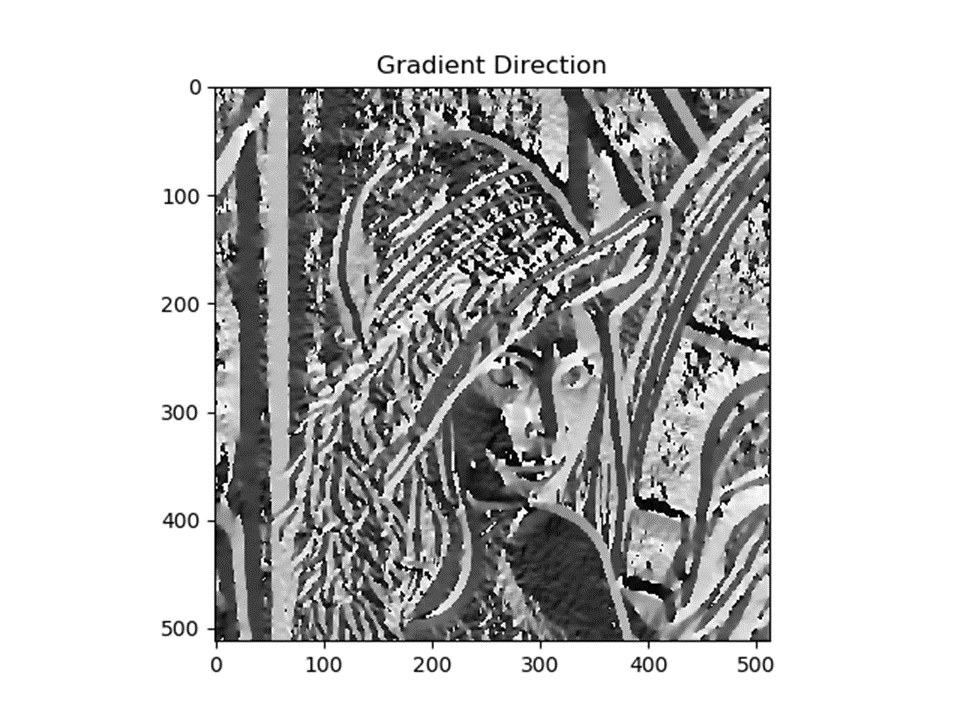
Kernel size = 6

图片包含 图示

描述已自动生成图片包含 图示

描述已自动生成图片包含 图形用户界面

描述已自动生成图片包含 图形用户界面

描述已自动生成图片包含 图表

描述已自动生成Strong edge ratio : Weak edge ratio = 0.03 : 0.01:图形用户界面, 应用程序

描述已自动生成

Here is the process to get the result:

1.Gaussian Smoothing: Apply Gaussian blur to the image

2.Calculating Image Gradient: Use Sobel operator to get the (df/dx) and (df/dy), then compute the gradient magnitude and gradient direction by applying the formula.

3.Suppressing Nonmaxima: This step is to find the local maxima in the “kernel covered area”, check the 8 directions and find the ridge, then compare the value on the two sides of the ridge to find the local maxima. And as for other non-local-maxima points, lower them to 0.

4.Thresholding and Edge Linking: separate the points into three groups: strong edges, weak edges, and zero edges. And then link the strong edges by the weak edges, which means if, as for a weak edge, there exists a strong edge around it, convert the weak edge to strong edge. Otherwise, lower it to zero.

From the outputs, I assume that if the Gaussian filter kernel is getting larger, the final output will be less detailed. I think it’s because that the smoothing will wipe the edges.

And if the actual value of the thresholds is smaller, there will be so much more noise on the output. My thinking is that the thresholds is to low, so it’s not like a threshold. It allow too many edges to pass the threshold.