DIP Project 1

1. Image enhancement

There is an image with low contrast and low brightness. You are required to use some algorithms you learned to make the image more natural, which including contrast enhancement, brightness enhancement, and so on (***Todo: Please proceed on Figure 1 and save your output picture as output_1.png***).

Figure 1 Original Image

2. Morphology

In some applications, we need to find the boundary of a shape in a binary image. Morphological algorithm can solve this problem very conveniently and you are required to realize it **without using the already built morphology libraries**. Given a binary image, please design a morphological algorithm to find its boundary, and the process is shown in Figure 2.1. ***Todo: Please proceed on Figure 2.2(size: 400*400) and save your output picture as output_2.png***. Tips: you may have to binarize the original image first.

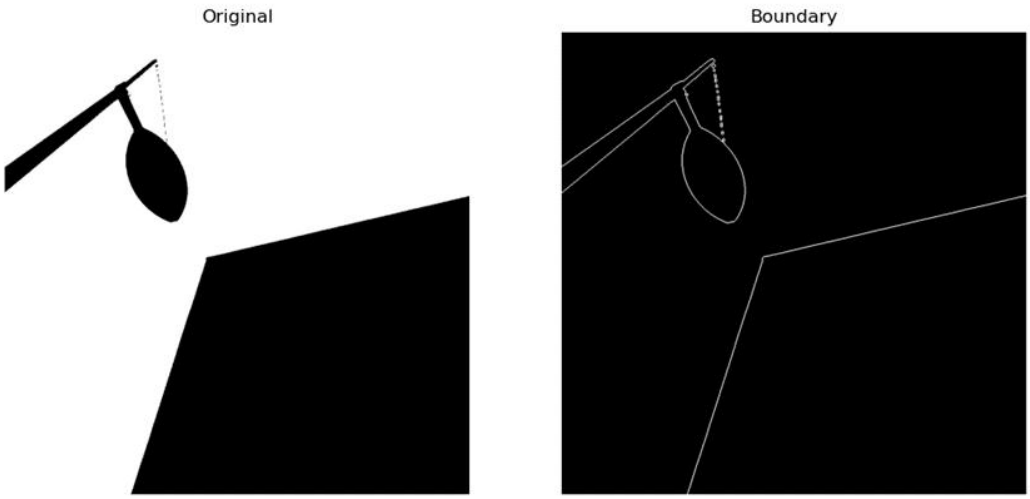

Figure 2 Binary image and it's boundary

Attention

(1) The programing language is not limited (e.g., MWORKS, Python etc.).

(2) You cannot call any third party library for key processing steps, but functions use to I/O images, visualization or do mathematics are allowed. Take python as an example, you cannot call any function from cv2 except I/O functions or visualization functions, and you can use numpy to do mathematics.

(3) You need to submit the source code and a brief report in English (Report template is given).

(4) Take it easy and Have fun! Most important: Do it by yourself!