Computer Vision HW1 - Advanced Color-to-Gray Conversion

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1. The design of joint bilateral filter

- load image之後使用 `cv2.copyMakeBorder` 來為圖片加padding
- 用 `np.meshgrid` 來建window並套公式算出spacial filter
- 套slide公式算range kernel，乘上spacial kernel後算出新圖的pixel值

2. The implementation of local minima selection

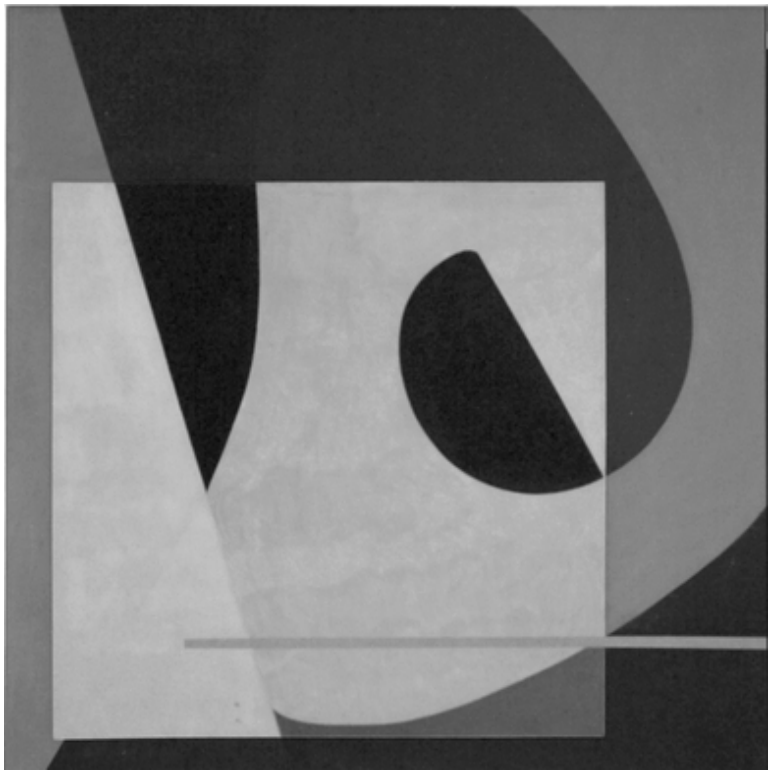
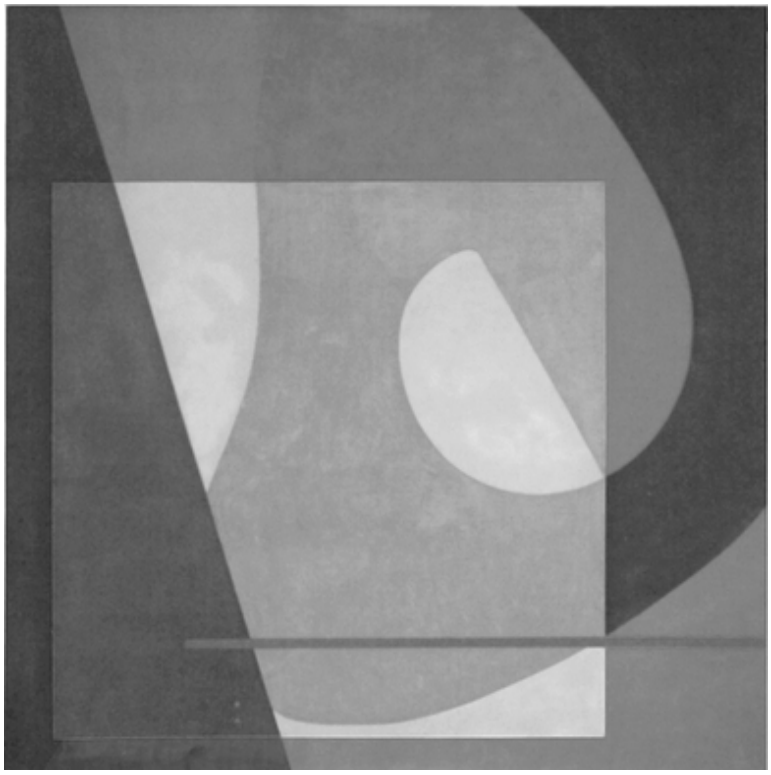
- 使用一個二維的numpy array來存灰階參數，一個維度代表w_r，另一維代表w_g，而w_b可由$1.0 - w_r - w_g$求得
- 每用一組參數算出cost後存在array中，而用來判斷一個點是否為local minima周圍的點為其(上、下、左、右、右上、左下)共6個參數點
- 使用 `np.roll` 平移整個矩陣，如此可以一次判斷所有點和其(上、下、左、右、右上、左下)點的大小關係，再把6個True/False矩陣and起來即可得此輪的local minima

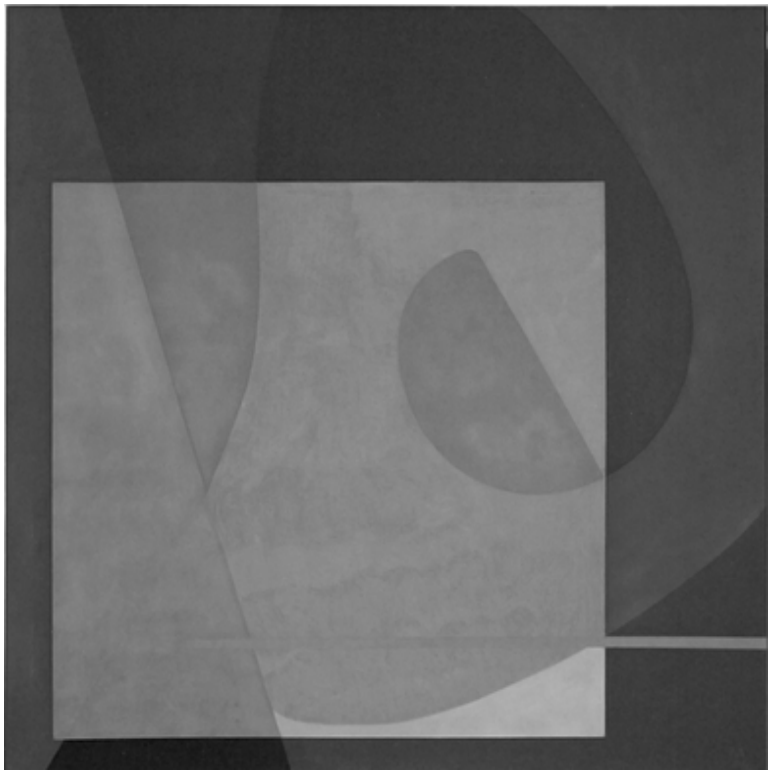
Input/output images and the corresponding weight combinations

1a.png

1a_gray.png

- 1a_y1.png

- 
  - weight: 0. 0. 1.
- 1a_y2.png
  - 
    - weight: 1. 0. 0.
- 1a_y3.png

- 
- weight: 0. 1. 0.

1b.png

1b_gray.png

- 1b_y1.png
  - 
    - weight: 0. 0. 1.
- 1b_y2.png

- 
  - weight: 0. 1. 0.
- 1b_y3.png
  - 
  - weight: 1. 0. 0.

1c.png

1c_gray.png

- 1c_y1.png
  - 
    - weight: 1. 0. 0.
- 1c_y2.png

- 

  - weight: 0. 1. 0.
- 1c_y3.png
  - 

  - weight: 0.2 0.8 0.