1. **Keypoinst.py**

import cv2

import numpy as np

img = cv2.imread("C:/5/image\_05164.jpg", cv2.IMREAD\_GRAYSCALE)

sift = cv2.SIFT\_create()

kp = sift.detect(img, None)

img = cv2.drawKeypoints(img, kp, None)

cv2.imshow("image", img)

cv2.waitKey(0)

cv2.destroyAllWindows()

1. **Descriptors.py**

import cv2

import numpy as np

img1 = cv2.imread("C:/5/image\_05164.jpg", cv2.IMREAD\_GRAYSCALE)

img2 = cv2.imread("C:/5/image\_05164 - Copy.jpg", cv2.IMREAD\_GRAYSCALE)

sift = cv2.SIFT\_create()

keypoints\_1, descriptors\_1 = sift.detectAndCompute(img1,None)

keypoints\_2, descriptors\_2 = sift.detectAndCompute(img2,None)

for d in descriptors\_1:

print(d)

cv2.imshow("image1", img1)

cv2.imshow("image2", img2)

cv2.waitKey(0)

cv2.destroyAllWindow()

1. **Number of Matches in image.py**

import cv2

import numpy as np

img1 = cv2.imread("C:/5/image\_05164.jpg", cv2.IMREAD\_GRAYSCALE)

img2 = cv2.imread("C:/5/image\_05164 - Copy.jpg", cv2.IMREAD\_GRAYSCALE)

sift = cv2.SIFT\_create()

keypoints\_1, descriptors\_1 = sift.detectAndCompute(img1,None)

keypoints\_2, descriptors\_2 = sift.detectAndCompute(img2,None)

bf = cv2.BFMatcher(cv2.NORM\_L1, crossCheck=True)

matches = bf.match(descriptors\_1,descriptors\_2)

print(len(matches))

cv2.imshow("image1", img1)

cv2.imshow("image2", img2)

cv2.waitKey(0)

cv2.destroyAllWindow()

1. **Matching for 2 images.py**

import cv2

import numpy as np

img1 = cv2.imread("C:/5/image\_05164.jpg", cv2.IMREAD\_GRAYSCALE)

img2 = cv2.imread("C:/5/image\_05164 - Copy.jpg", cv2.IMREAD\_GRAYSCALE)

sift = cv2.SIFT\_create()

keypoints\_1, descriptors\_1 = sift.detectAndCompute(img1,None)

keypoints\_2, descriptors\_2 = sift.detectAndCompute(img2,None)

#feature matching

bf = cv2.BFMatcher(cv2.NORM\_L1, crossCheck=True)

matches = bf.match(descriptors\_1,descriptors\_2)

matches = sorted(matches, key = lambda x:x.distance)

img3 = cv2.drawMatches(img1, keypoints\_1, img2, keypoints\_2, matches[:40], None, flags=2)

for m in matches:

print(m.distance)

cv2.imshow("Img1", img1)

cv2.imshow("Img2", img2)

cv2.imshow("Img3", img3)

cv2.waitKey(0)

cv2.destroyAllWindow()