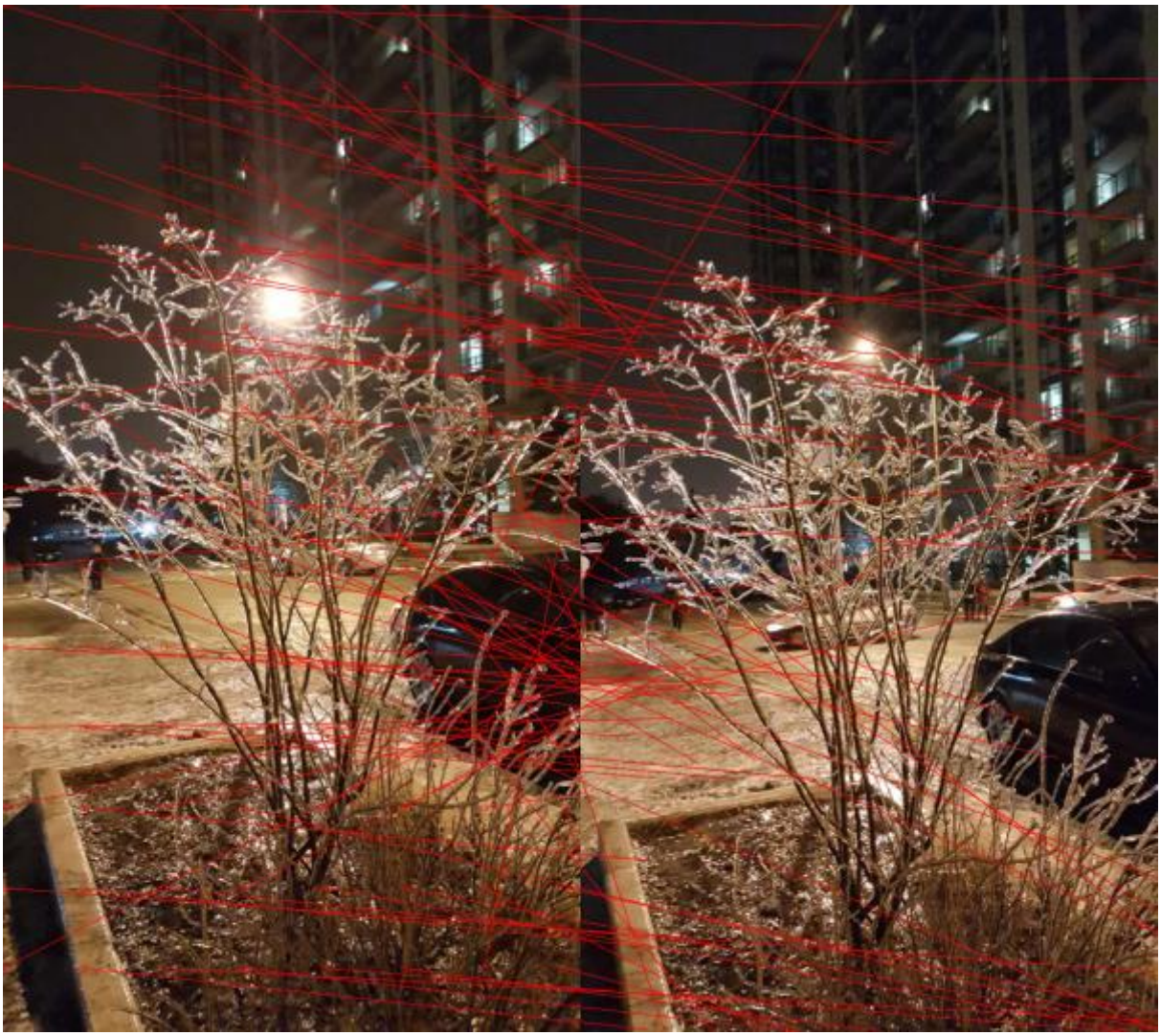
Assignment 3 Report

In this report, we will compare two pairs of images, and discuss the strength and weakness of this algorithm.

Pair1:



Vector Image

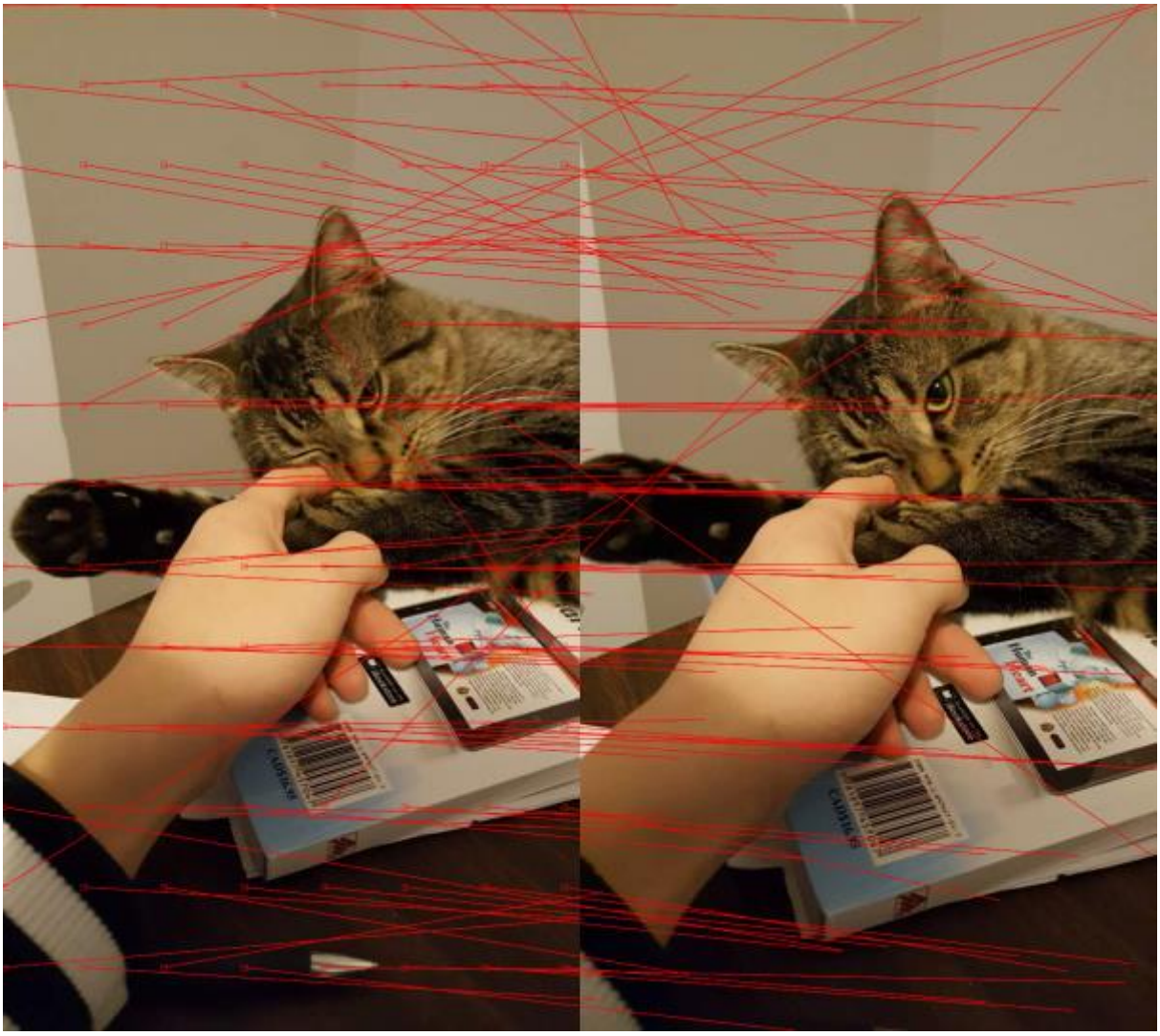
NNF Image

NNF Image

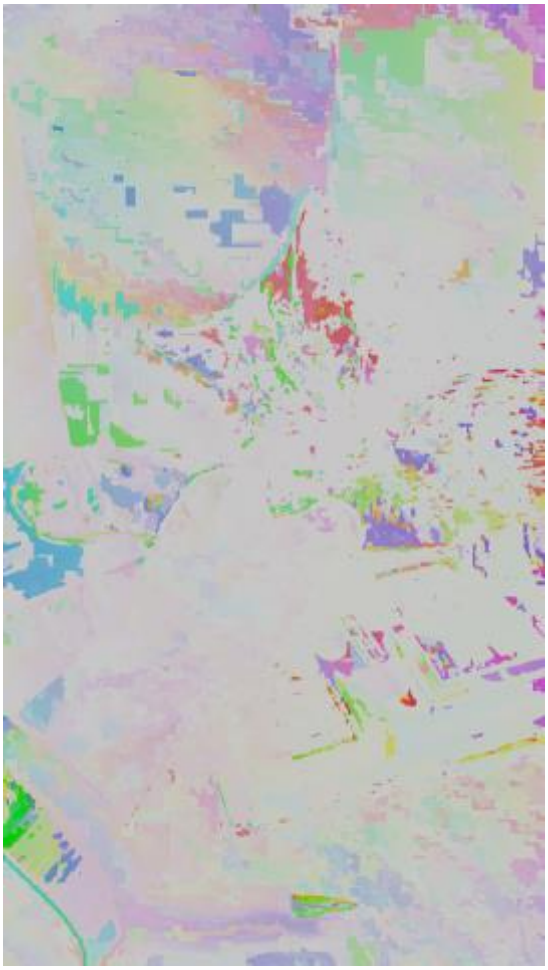
Reconstructed Image

In this pair, two images contain the same object, the frozen tree. We are expecting that the algorithm can find the corresponding patches from the target image. In NNF image we can see that the left bottom and very bright parts have good matching because the algorithm can find similar patches with similar intensity from the target image.
On the other hand, around light part, the NNF image showing red color, this means the algorithm reconstruct that parts from a different direction. Since at the source image, the tree branch around the light has high intensity, while the branch around the light has relatively low intensity at target image, the algorithm fails to recognize the real breach from the target.
As a result, in the reconstructed image, the branch around the light is blurrier than the left side of the image.

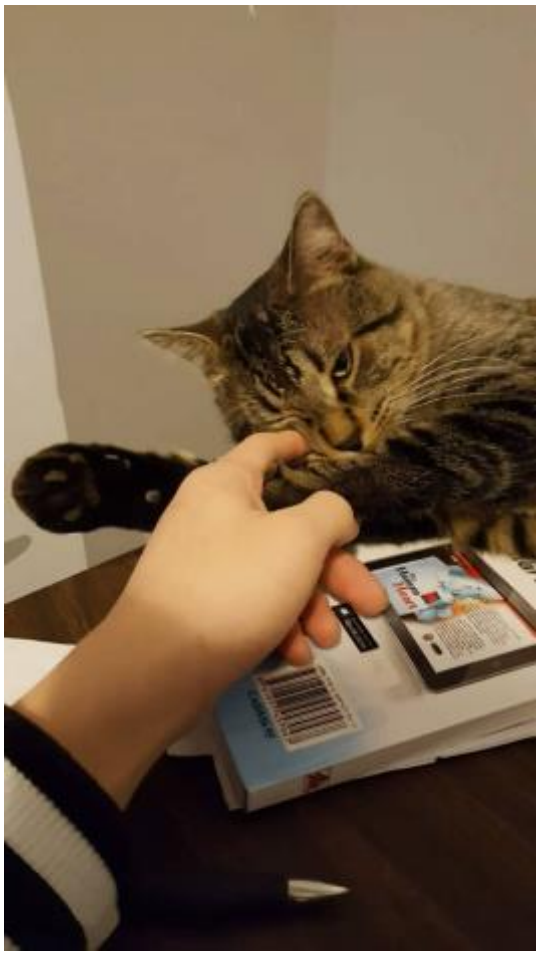
Pair2:



Vector Image



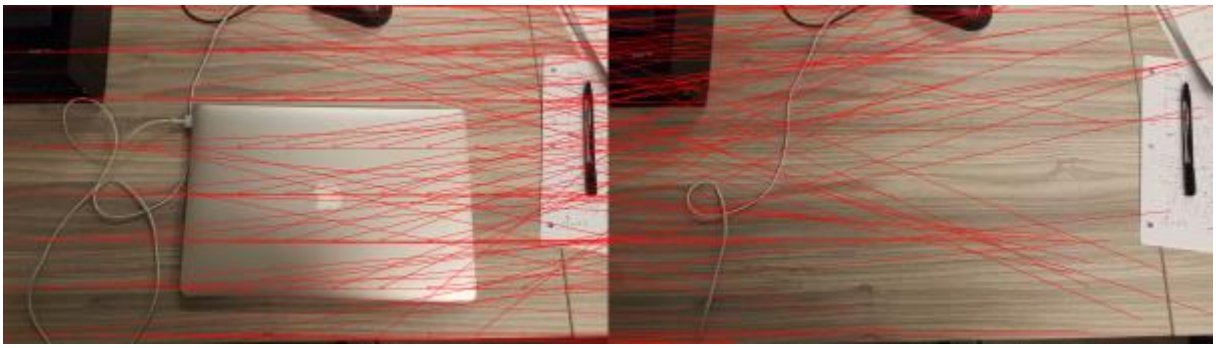
NNF Image



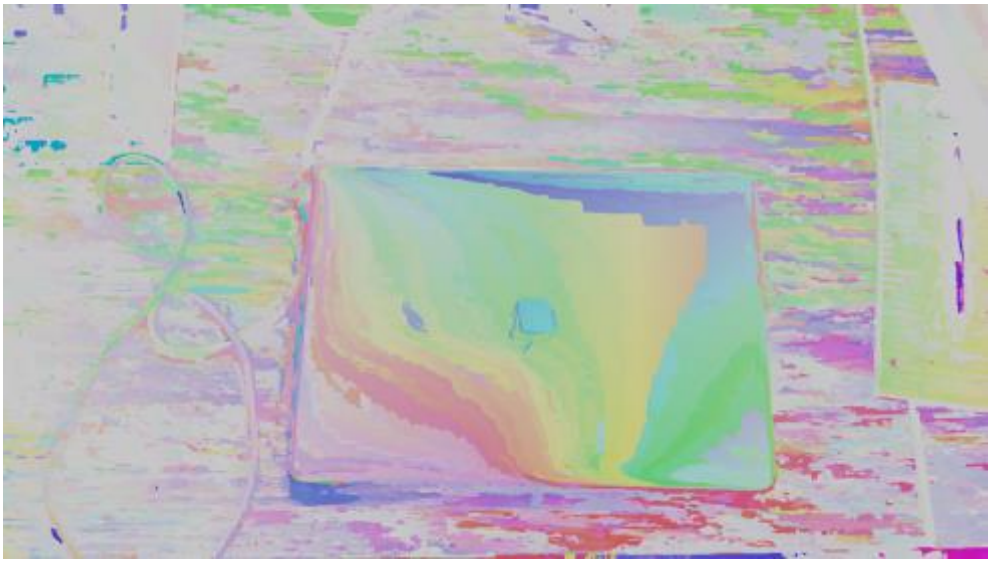
Reconstructed Image

In this pair, the algorithm shows a good patches match. The reconstructed image is almost the same as the source image. First, we can notice that target image is a little bit shift downward, but most of the patches found by the algorithm are also move downward in the same direction. Second, we can see that cat's ear on two images are different. At NNF image, cat's ear part is red, so the algorithm finds a region to reconstruct the source image, and from the vector image, the algorithm decides to use cat's ear at target image to rebuild the picture. Therefore, this algorithm can successfully recognize the object from target image when the intensity on two images is almost the same.

Pair3:



Vector Image



NNF Image

Reconstructed Image

In this pair, the algorithm can correctly reconstruct objects from the target image. However, the target image does not contain that object at all. In source image, there is a laptop, whereas, there is no laptop at target image at all. Since the algorithm tries to find the most similar patch from target image for each pixel, the algorithm eventually found the most similar one to reconstruct a laptop.

In conclusion, this algorithm can find the most reasonable patches match when the intensity is same on both images. It can also recreate objects appear in the source image, but those objects do not appear in the target image. When the intensity is very different, this algorithm will fail to match the real patch from the target image.