

CSC320: Assignment # 1

Due on Saturday, January 24, 2015

Shihao Zhao

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Part 0: Image data description

The image data consists of three inverted negatives (top to bottom: blue, green, red). And in this project, we have small images and large images to work with. Here are some small and large images I worked with, Figure 1 - Figure 5.



Figure 1: This small image size is 1024×401 .



Figure 2: This small image size is 1024×396 .



Figure 3: This small image size is 1024×394 .



Figure 4: This is a screen shot of the large image. The original image size is 9588×3703 .



Figure 5: This is a screen shot of the large image. The original image size is 9715×3741 .

Part 1: Comparing the matchings using SSD and NCC

In this part, I will show three group of images, which will show the difference between the implementation of SSD and NCC.

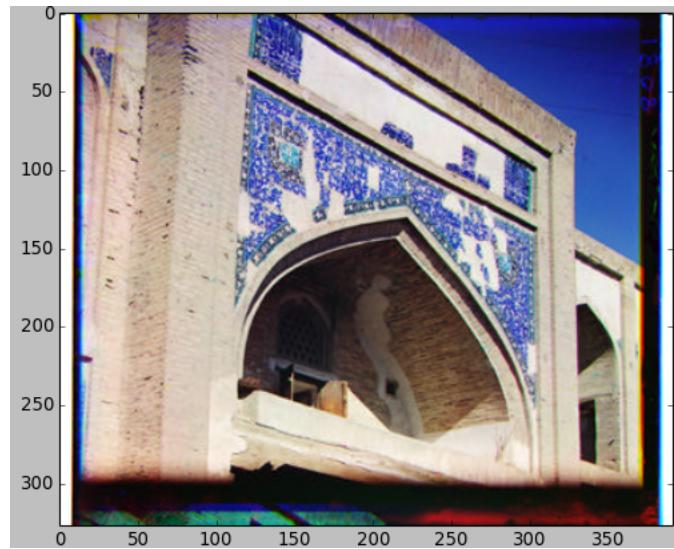


Figure 6: This is the picture generated from 01880v.jpg using SSD. Generated using A1('images/01880v.jpg', 0, 0).

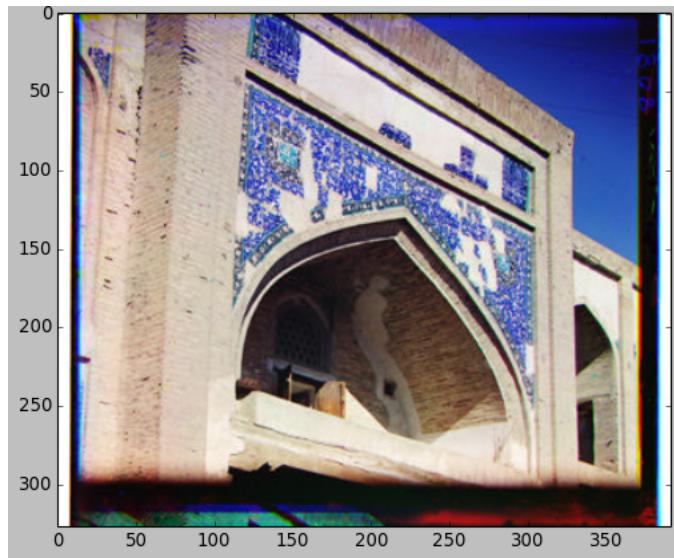


Figure 7: This one used NCC. Generated using A1('images/01880v.jpg', 1, 0)

These two work equally well as we can observe.

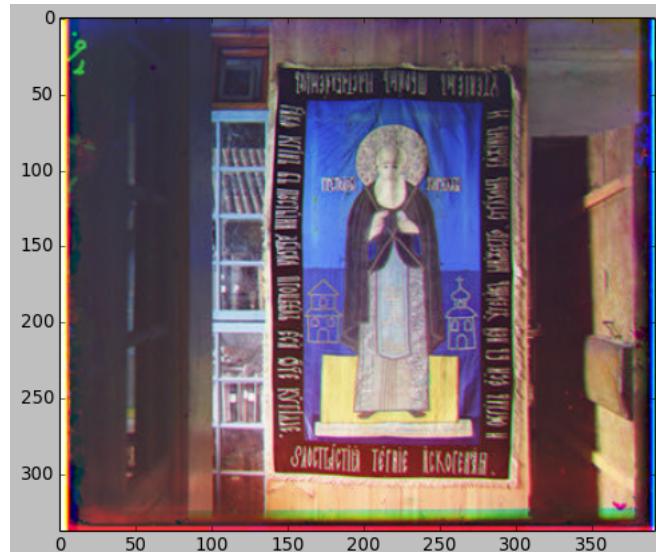


Figure 8: This is the picture generated from 01031v.jpg using SSD. Generated using A1('images/01031v.jpg', 0, 0).

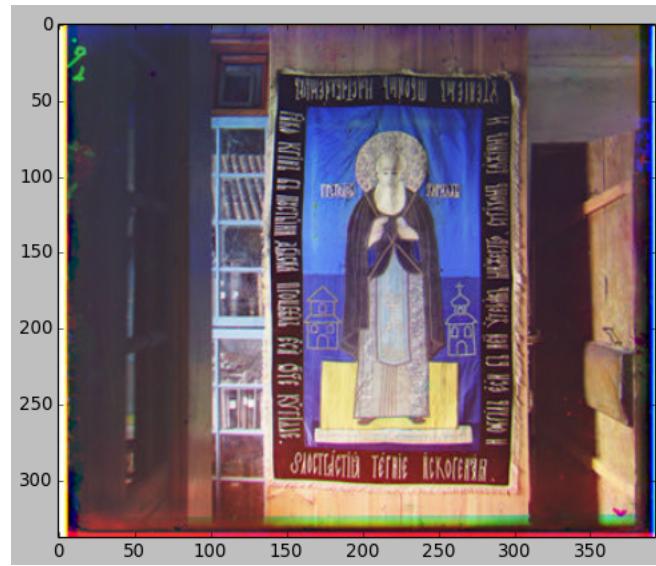


Figure 9: This one used NCC. Generated using A1('images/01031v.jpg', 1, 0)

These two have almost the same result, but if observing carefully, the NCC picture shows a little more details(see the characters in the pictures).



Figure 10: This is the picture generated from 00106v.jpg using SSD. Generated using A1('images/00106v.jpg', 0, 0).



Figure 11: This one used NCC. Generated using A1('images/00106v.jpg', 1, 0)

This time, in my implementation, SSD works better. As we can observe in the NCC picture, the top edge on the man's hat turned green and the forehead of the man turned red. Overall, for most pictures, SSD and NCC works equally fine. But for the picture in which the contrast ratio is low, SSD will win. There are some artefacts in the result image. The noise on the border can impact it. The image where the colors of objects and background are similar can also impact it.

Part 2: Results and runtime of large pictures

In this part, I will show two groups of images, and describe the result and runtime.

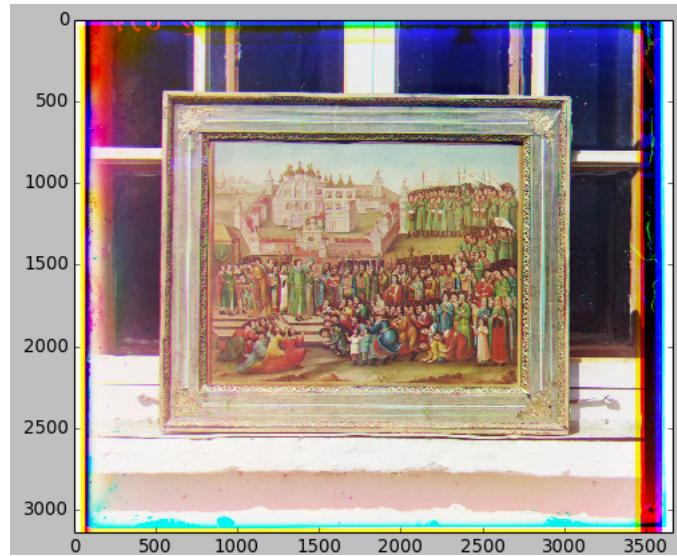


Figure 12: This is the combined picture from 00128u.png using SSD. Generated using A1('images/00128u.png', 0, 1). The result picture has a decent quality, except for the noise on the border. However, the object in the picture is clear, and the edges of the object are recognizable. The running time of using SSD is roughly 12.4 sec on my computer(i7)

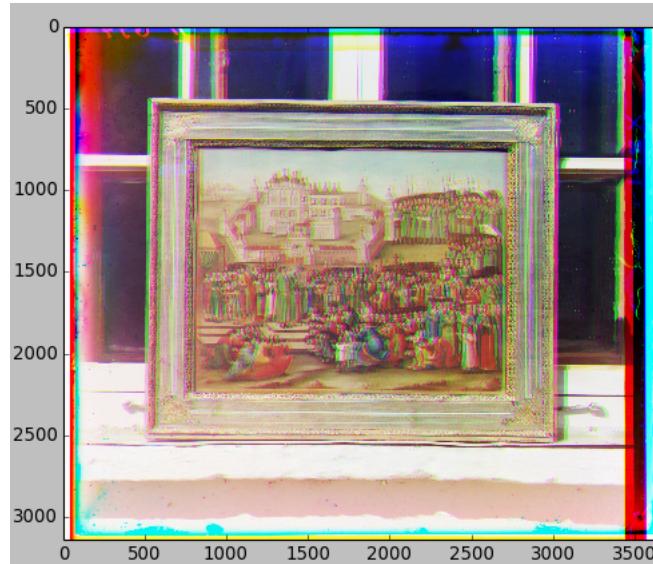


Figure 13: This one used NCC. Generated using A1 ('images/00128u.png', 1, 1). The quality result picture is okay, but not as good as SSD in my implementation. The edges of objects are kind of blurry. The running time is roughly 30 sec.

Advice: make observations about the output, and try to explain them.



Figure 14: This is the combined picture from 00458u.png using SSD. Generated using A1('images/00458u.png', 0, 1). The quality of result picture is good. The object in the picture is clear, and the edges of the object are recognizable. The running time of using SSD is roughly 11.7 sec on my computer(i7)



Figure 15: This one used NCC. Generated using A1 ('images/00458u.png', 1, 1). The quality result picture is still not as good as SSD in my implementation. The edges of objects are kind of blurry. The running time is roughly 28 sec.

Overall, the running time is far longer than with small images, even though having used resizing algorithm. And the quality of result picture is good with SSD, but can be blurry with NCC in my implementation.
Advice: make observations about the output, and try to explain them.