

CSE 473/573 Homework 1

Problem 1. Colorizing the Prokudin-Gorskii photo collection

Brief Description of my Approach

- I take each file with name part1_*.jpg from the directory.
- I read in the image.
- I compute height and width of the image.
- I get B, G, R plates from the actual image by dividing the height by 3.
- I then take the Blue plate as an anchor and align the rest of the 2 plates with it.
 - I crop the borders from the Blue and Red/Green plate
 - I use edge detection algorithm on the plates.
 - I do an exhaustive search over a window of $[-20, 20]$ displacements.
 - I find the sum of squared differences (SSD) for the Blue plate and the shifted Red/Green plate.
 - I then take the vectors for the lowest SSD.
- With the vectors of the lowest SSD I shift the Red/Green Plate to align all the 3 plates.
- I then concatenate the shifted Red, shifted Green and the Base Blue plate to form the colorized image.

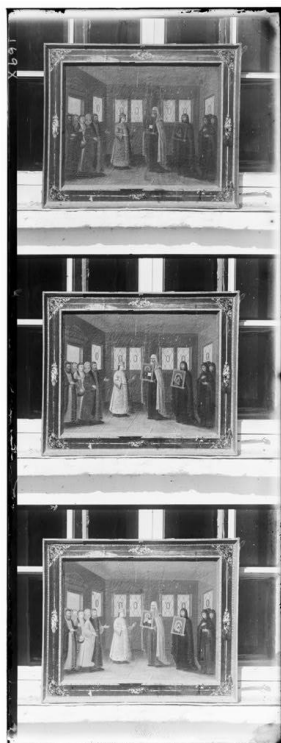
Resulting Images from my program:



DIGITIZED PROKUDIN-GORSKII GLASS PLATE IMAGE
part1_1.jpg



Displacement vector for Red : (10, 1)
Displacement vector for Green : (6, 2)



DIGITIZED PROKUDIN-GORSKII GLASS PLATE IMAGE
part1_2.jpg



Displacement vector for Red : (9, 2)
Displacement vector for Green : (4, 2)



DIGITIZED PROKUDIN-GORSKII GLASS PLATE IMAGE
part1_3.jpg



Displacement vector for Red : (15, 4)
Displacement vector for Green : (7, 3)



DIGITIZED PROKUDIN-GORSKII GLASS PLATE IMAGE
part1_4.jpg



Displacement vector for Red : (13, 1)
Displacement vector for Green : (4, 1)



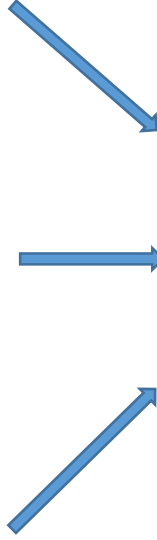
DIGITIZED PROKUDIN-GORSKII GLASS PLATE IMAGE
part1_5.jpg



Displacement vector for Red : (11, 4)
Displacement vector for Green : (5, 3)



DIGITIZED PROKUDIN-GORSKII GLASS PLATE IMAGE
part1_6.jpg



Displacement vector for Red : (5, 1)
Displacement vector for Green : (0, 0)