Joshua Preuss

5/7/2024

CSC 340

Assignment 6: Image Stitching

The purpose of this assignment was to take 2 images and stitch them together creating a panorama of the two images. The program starts by calculating the homography matrix for the images. It then gets the dimensions of the panorama by multiplying the homography matrix by each of the 4 corners in image 1, the resulting 4 corners being the new corners of image 1 when warped to fit together with image 2. The program then takes the minx, minY, maxX, and maxY of the new corners of image 1 and the corners of image 2. It then gets the total dimensions of the panorama by subtracting maxX – minY = x, and maxY – minY = y. Then the program places image 2 into the panorama. The program then iterates through all the pixels in the panorama and maps them back to image 1 using the inverse of the homography matrix. At each of these pixels if it falls in image 1, the program calculates the color difference and adds it to a running sum. Finally, program loops again and at each pixel, if it falls in image 1, the pixel is copied over from image 1 with the correct color adjustments.

Images from output:

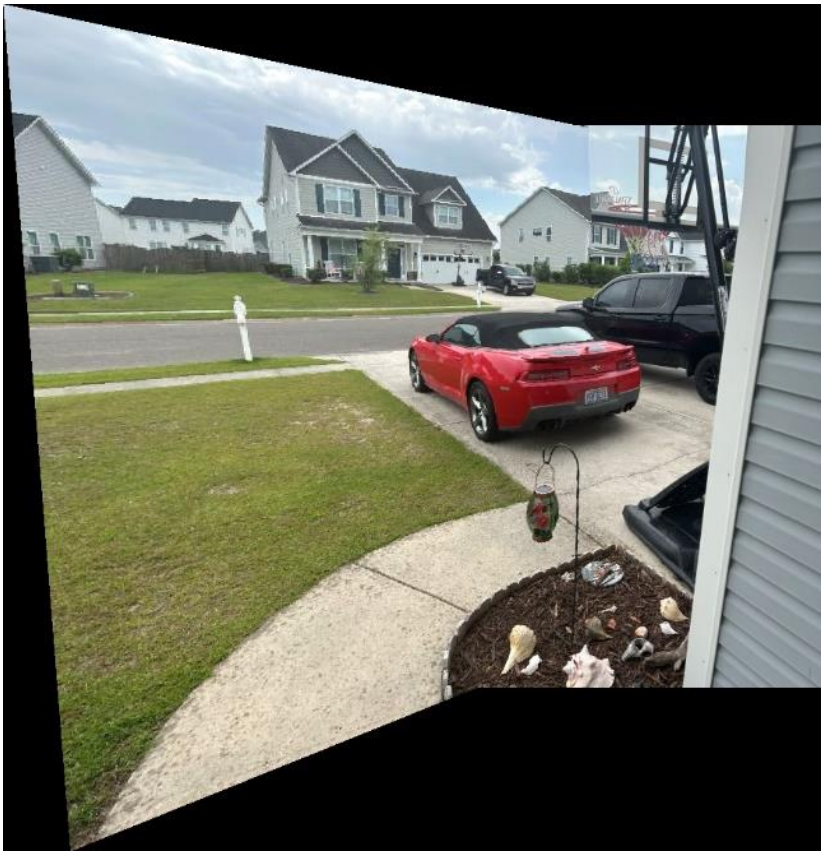
Florence Left and Right images:

Mountain Left and Right images:

Queenstown Left and Right images:

Waterfall 1 and Waterfall 2:

2 images I took myself stitched together:



Issues Encountered:

I didn't run into a whole lot of issues when coding this assignment, but the ones I did encounter were small and easy to resolve with help from the instructor. The first issue I encountered was getting the dimensions of the panorama to calculate properly. The root of the issues was that I wasn't casting the min and max values into integers, which caused an error in producing the image because image bounds have to be integers. The second issue I encountered was getting image 1 to map properly onto the panorama. This was resolved by fixing the points that are used to put the image in the correct spot. The final issue I encountered was getting the color differences to calculate properly. This was resolved by splitting the color calculation and mapping over image 1 into two loops. The first loop consisted of the code to calculate the average color difference and the second loop used these values to map image 1 over to the panorama with the correct color blending. Besides those issues I had a pretty easy time coding this assignment.