Computer Vision
Spring 2017
Problem Set #6

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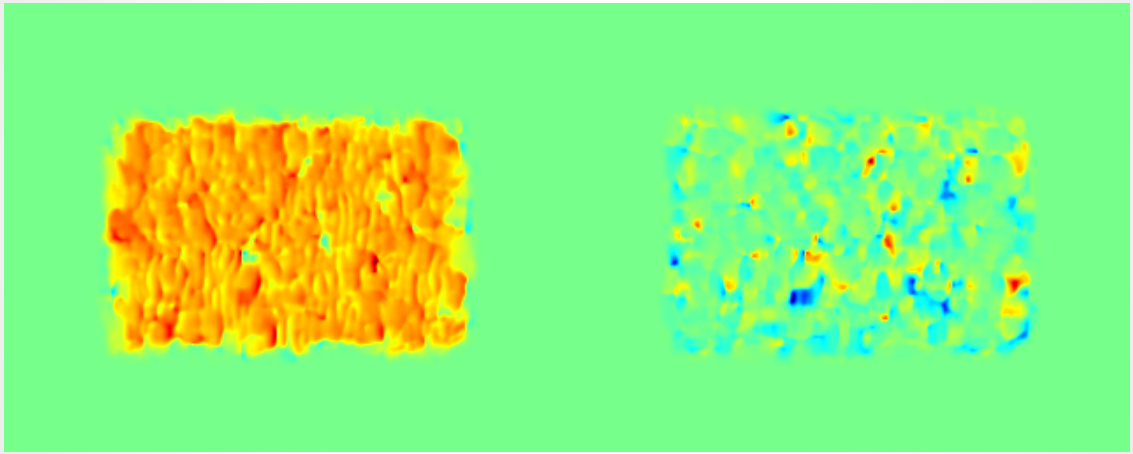
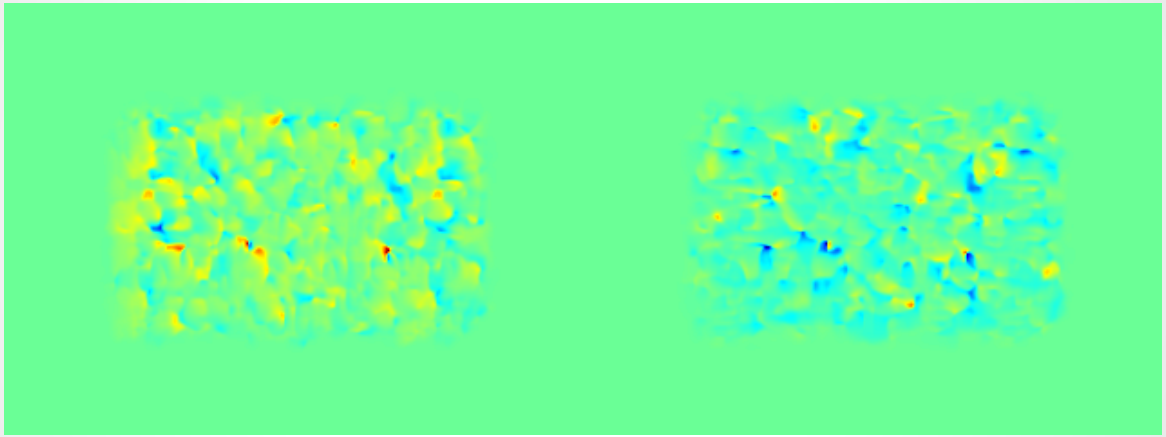
1a: Base Shift0 and ShiftR2



Base Shift0 and ShiftR2 pair image **- ps6-1-a-1.png**

1a: Base Shift0 and ShiftR5U5 (cont.)



Base Shift0 and ShiftR5U5 pair image **- ps6-1-a-2.png**

1a: Text Response (cont.)

Describe your results. Did you blur the images? If so, by how much?

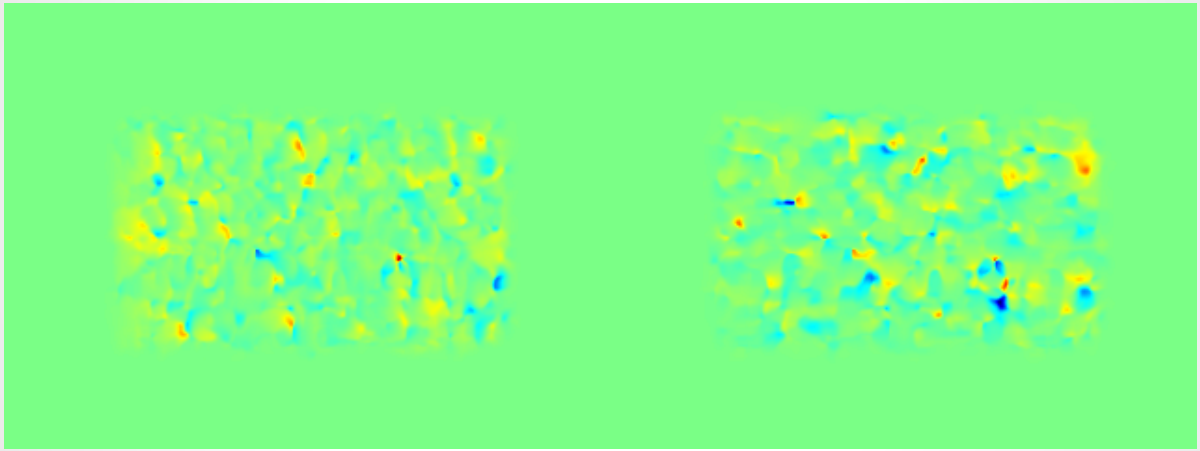
I Gaussian blurred all the images with a kernel of size 7x7.

Left half of optical flow image from Shift0 to ShiftR2 are U values, and right half are V values.

As we can see from **ps6-1-a-1.png,** U values are predominant because center part of image is moved to right by 2 pixels.

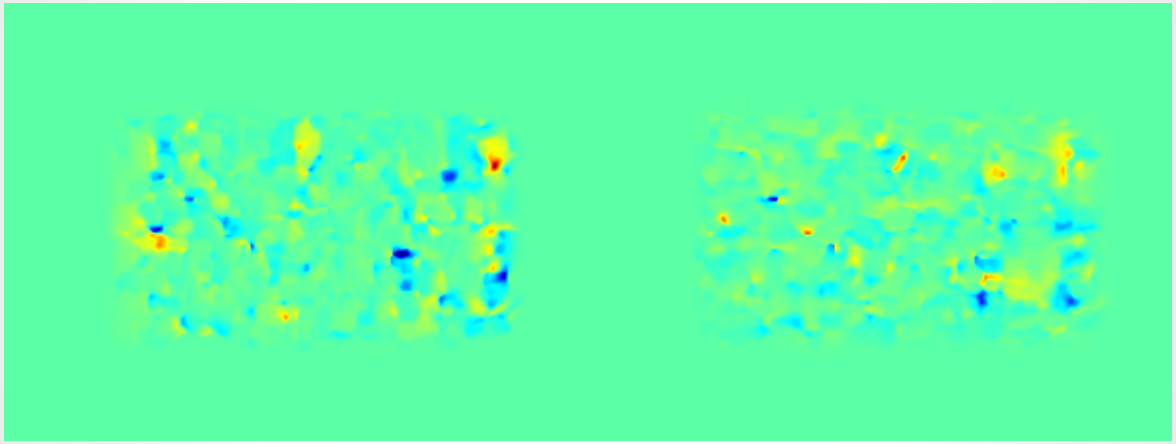
As we can see from **ps6-1-a-2.png,** both U and V values vary in similar way because center part of the image B has been moved Up an Right by 5 pixels.

1b: Base Shift0 and ShiftR10



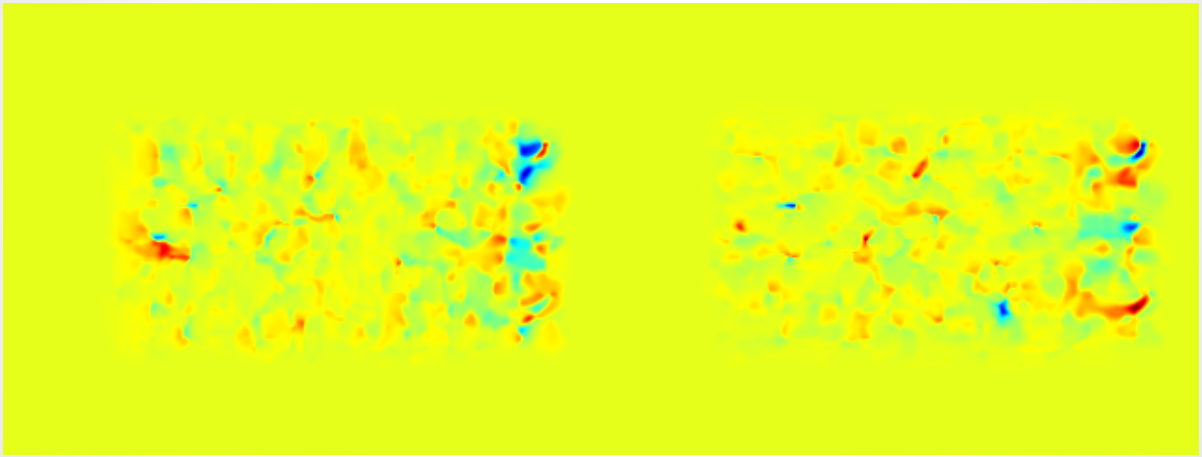
Base Shift0 and ShiftR10 pair image **- ps6-1-b-1.png**

1b: Base Shift0 and ShiftR20 (cont.)



Base Shift0 and ShiftR20 pair image **- ps6-1-b-2.png**

1b: Base Shift0 and ShiftR40 (cont.)



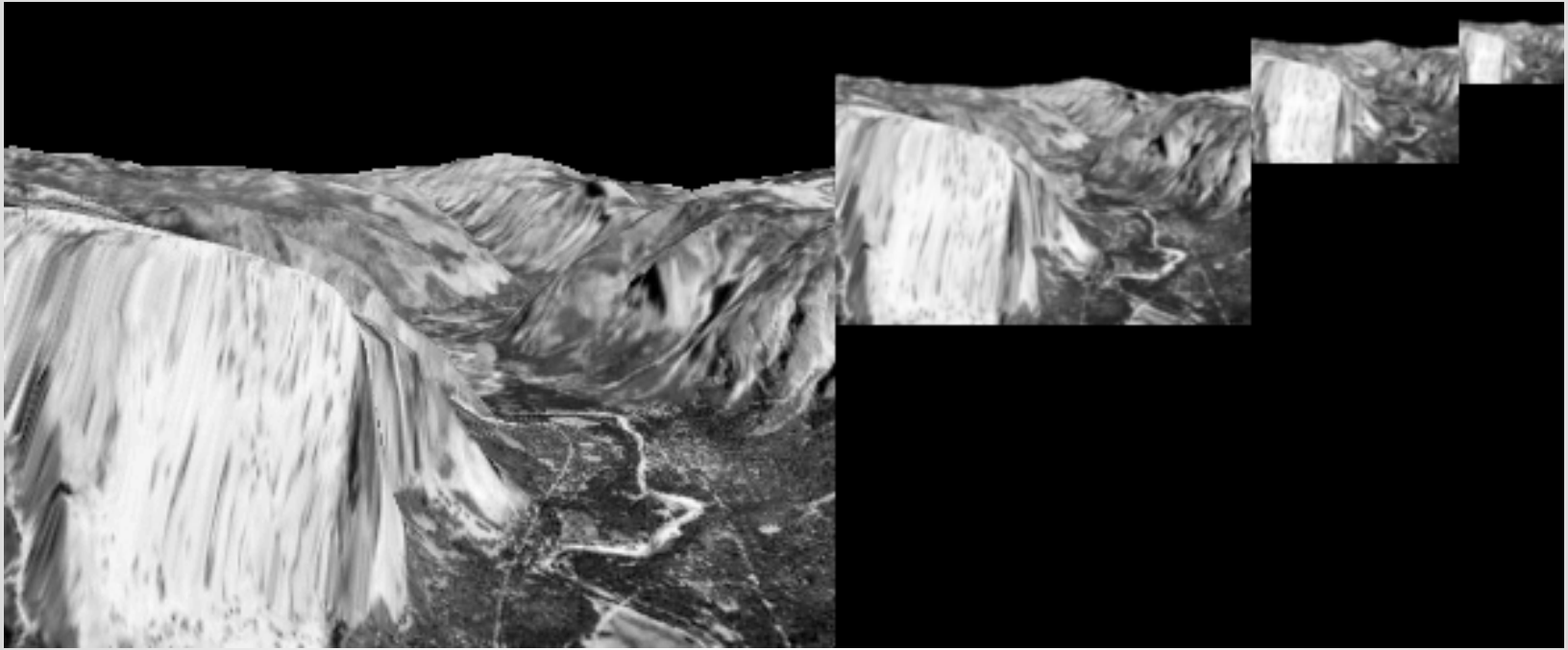
Base Shift0 and ShiftR40 pair image **- ps6-1-b-3.png**

1b: Text Response (cont.)

Describe your results. Using the same amount of blurring in 1a, did this still work? Do your results fall apart on any of the pairs?

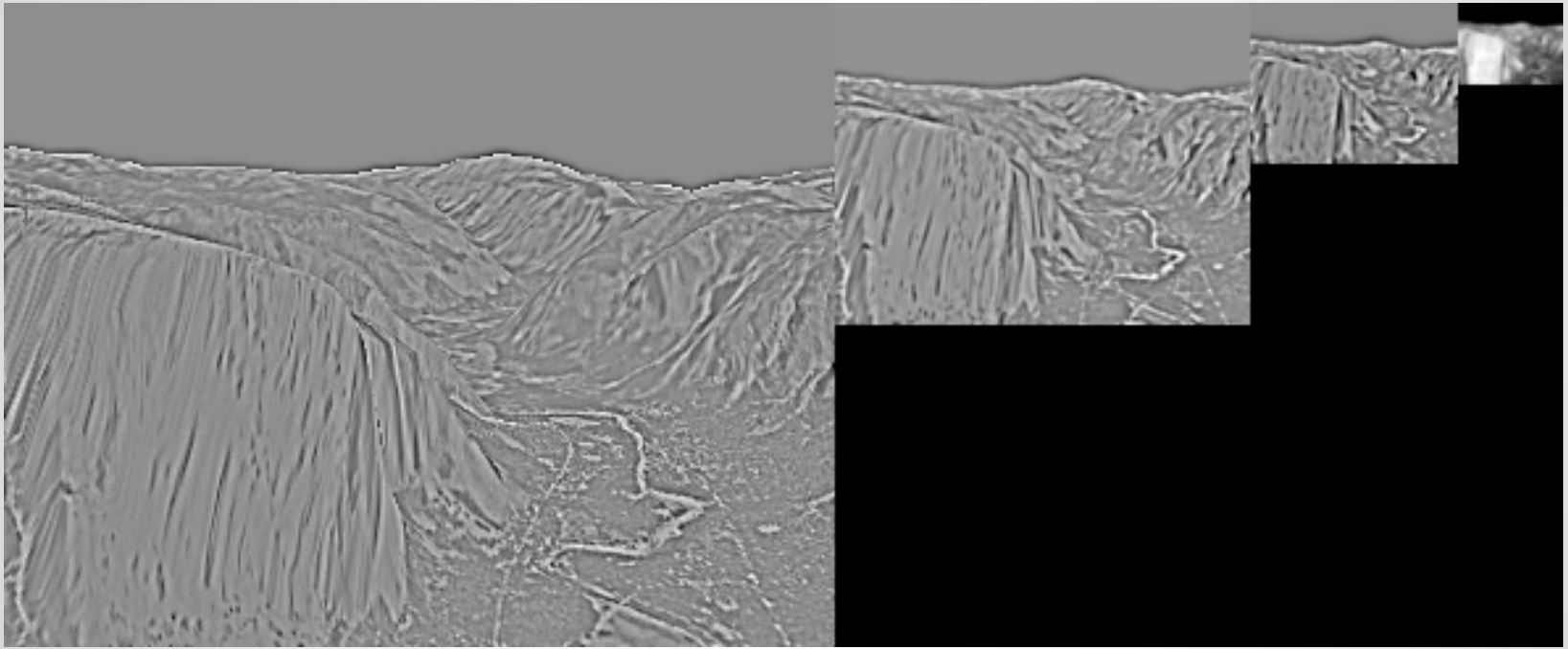
As we can see in **ps6-1-b-2.png** and **ps6-1-b-3.png**, using the same amount of blurring has increased the error progressively. Few blue spots in ps6-1-b-2.png indicate the increase in error. There are lots of blue and red spots in ps6-1-b-3.png indicating even more increase in error as the amount of shift of center part of the images increases.

2a: Gaussian Pyramid



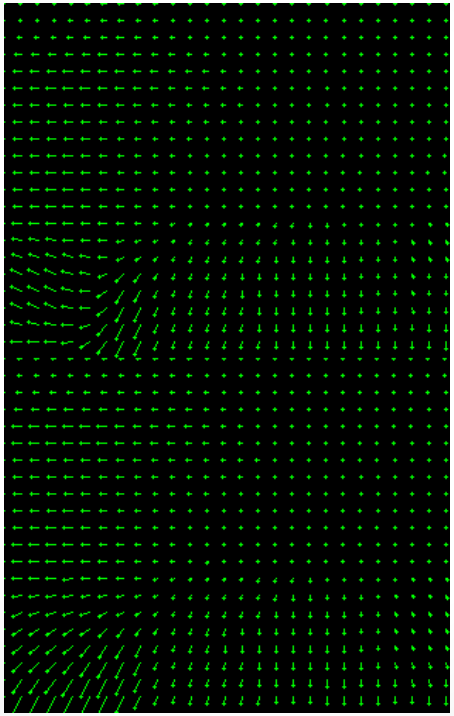
Gaussian Pyramid Image **- ps6-2-a-1.png**

2b: Laplacian Pyramid



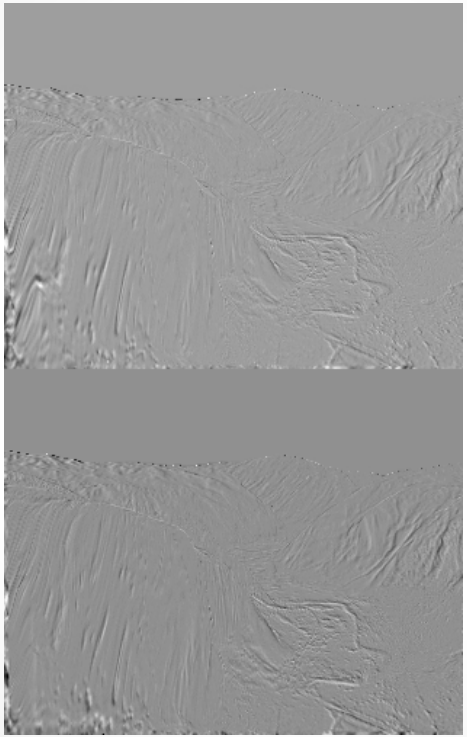
Laplacian Pyramid Image **- ps6-2-b-1.png**

3a: DataSeq1 displacements



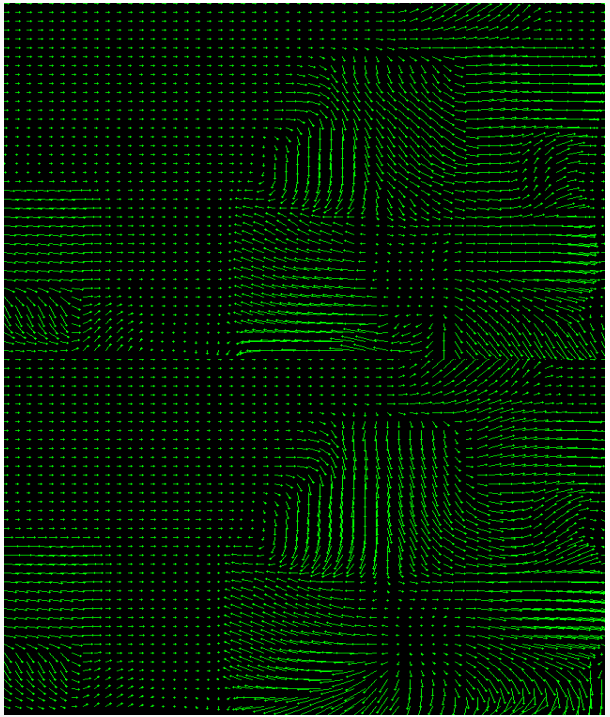
DataSeq1 displacement image **- ps6-3-a-1.png**

3a: DataSeq1 Difference (cont.)



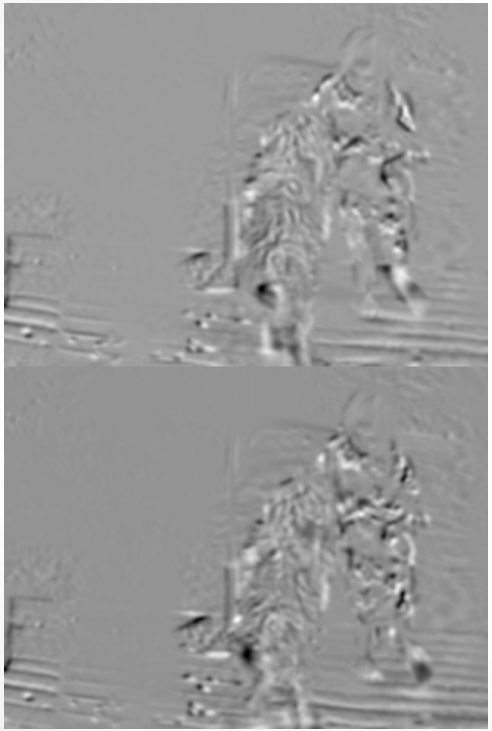
DataSeq1 difference image **- ps6-3-a-2.png**

3a: DataSeq2 displacements (cont.)



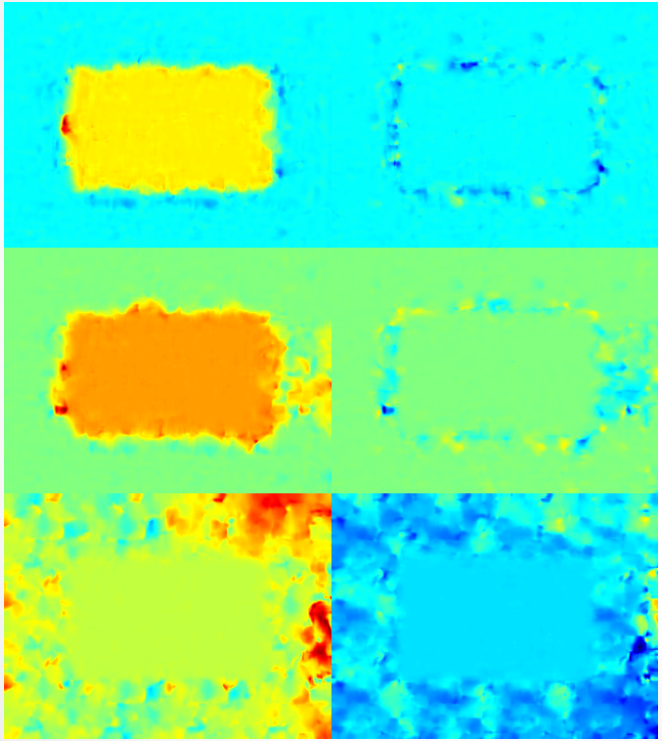
DataSeq2 displacement image **- ps6-3-a-3.png**

3a: DataSeq2 Difference (cont.)



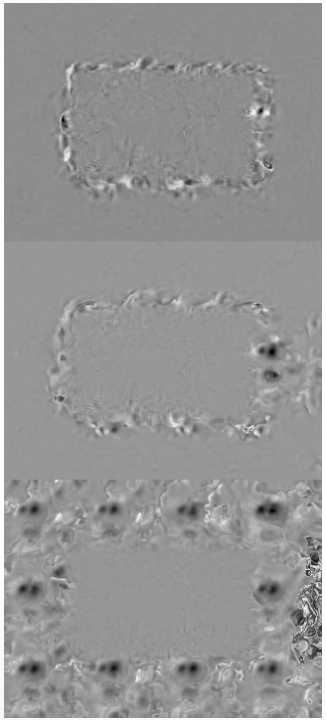
DataSeq2 difference image **- ps6-3-a-4.png**

4a: TestSeq displacements



TestSeq displacement image **- ps6-4-a-1.png**

4a: TestSeq difference (cont.)

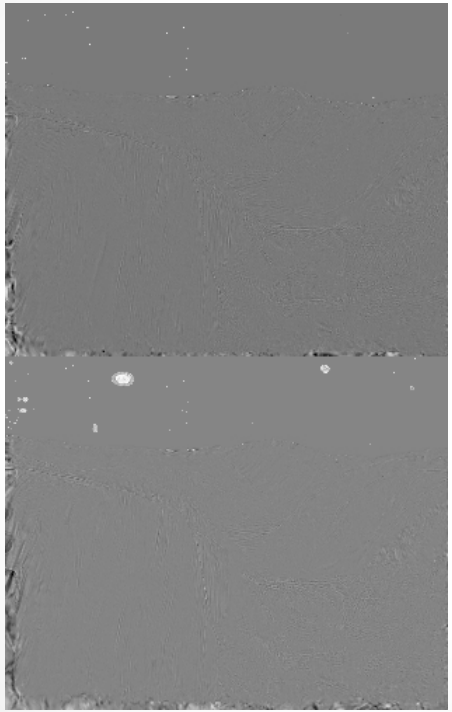


TestSeq1 difference image **- ps6-4-a-2.png**

4b: DataSeq1 displacements

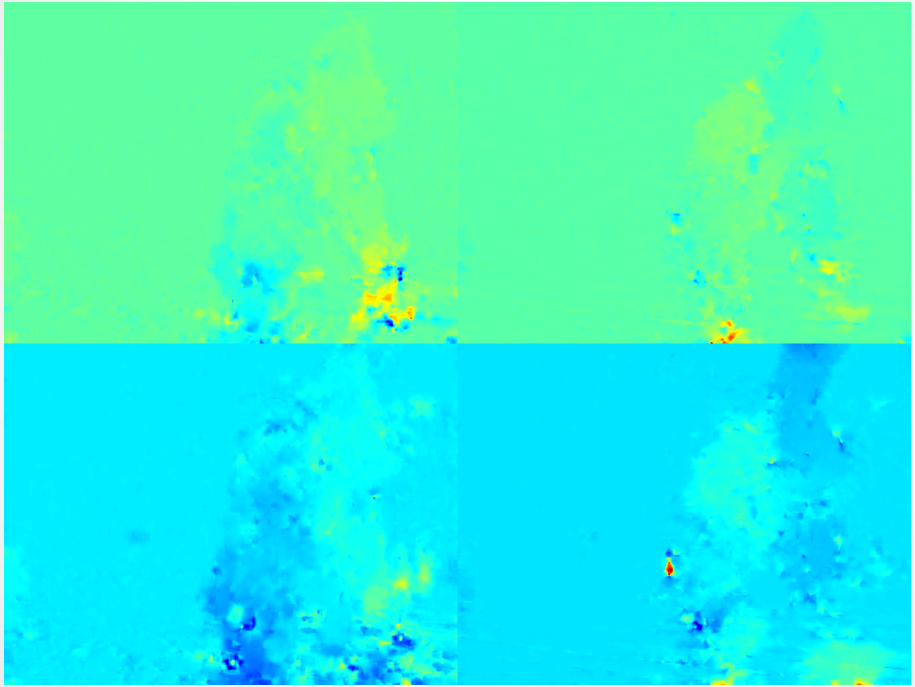
DataSeq1 displacement image **- ps6-4-b-1.png**

4b: DataSeq1 difference (cont.)



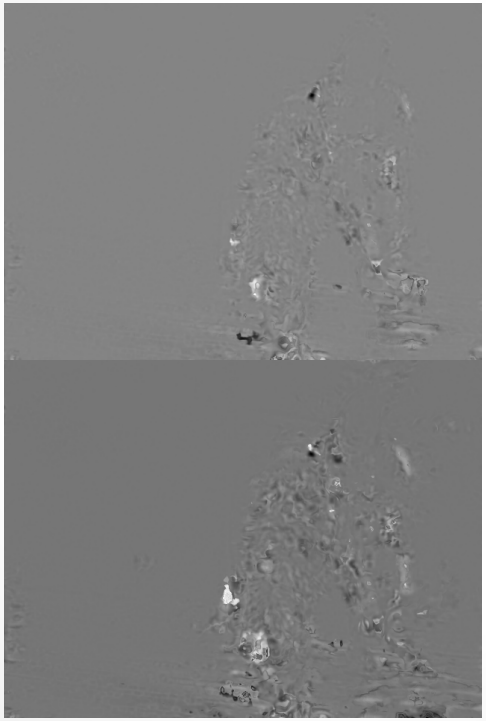
DataSeq1 difference image **- ps6-4-b-2.png**

4c: DataSeq2 displacements



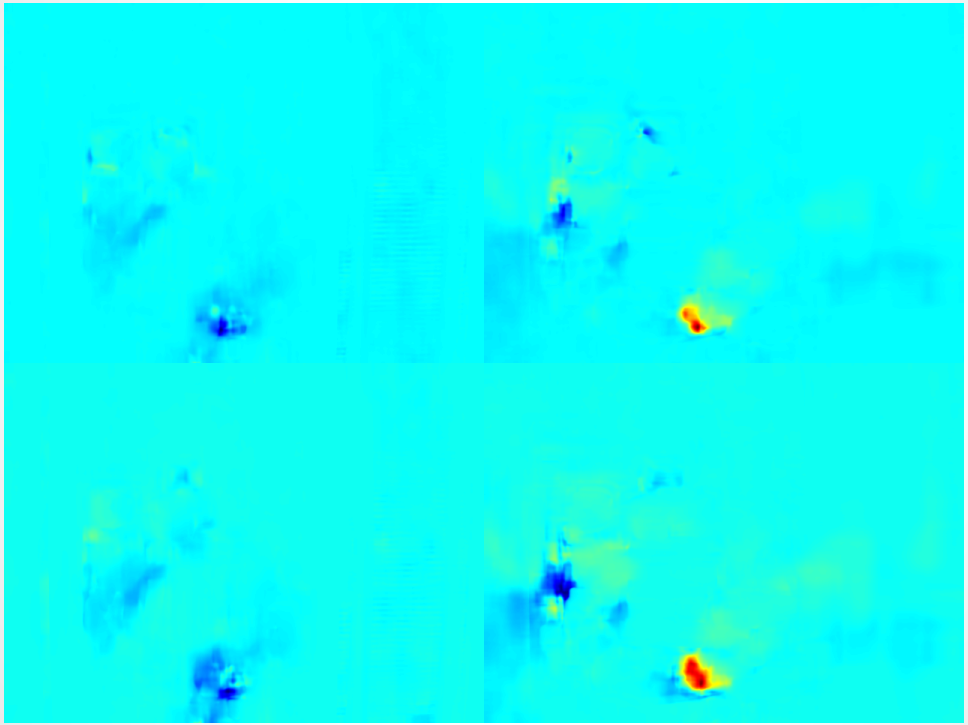
DataSeq2 displacement image - **ps6-4-c-1.png**

4c: DataSeq2 difference (cont.)



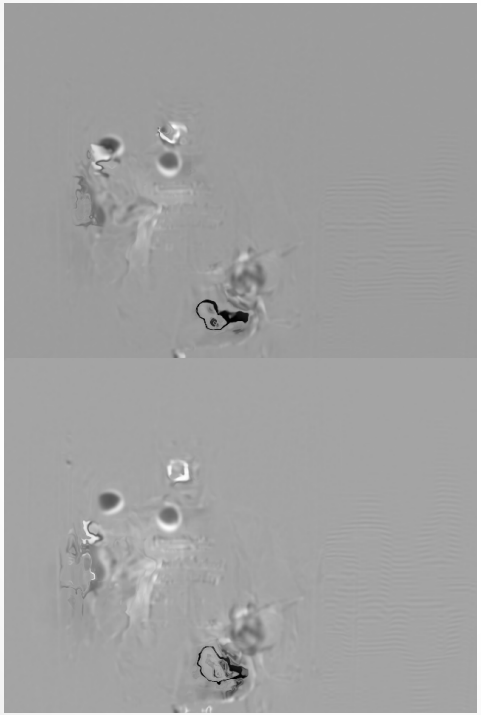
DataSeq2 difference image **- ps6-4-c-2.png**

5a: Juggle displacement CHALLENGE



Juggle displacement image **- ps6-5-a-1.png**

5a: Juggle Difference (cont.)



Juggle difference image **- ps6-5-a-2.png**

5a: Text response (cont.)

Describe your results. What did you do to get these results?

I Converted all the images to GRAY scale, divided the pixel values by 255 so that image values are in range [0, 1]. I also Gaussian blurred all the images with filter size of 7x7. I did lot of trail and error to find out the best values for the maximum number of levels and kernel size. Best result is obtained for maximum levels = 15 and kernel size = 20.