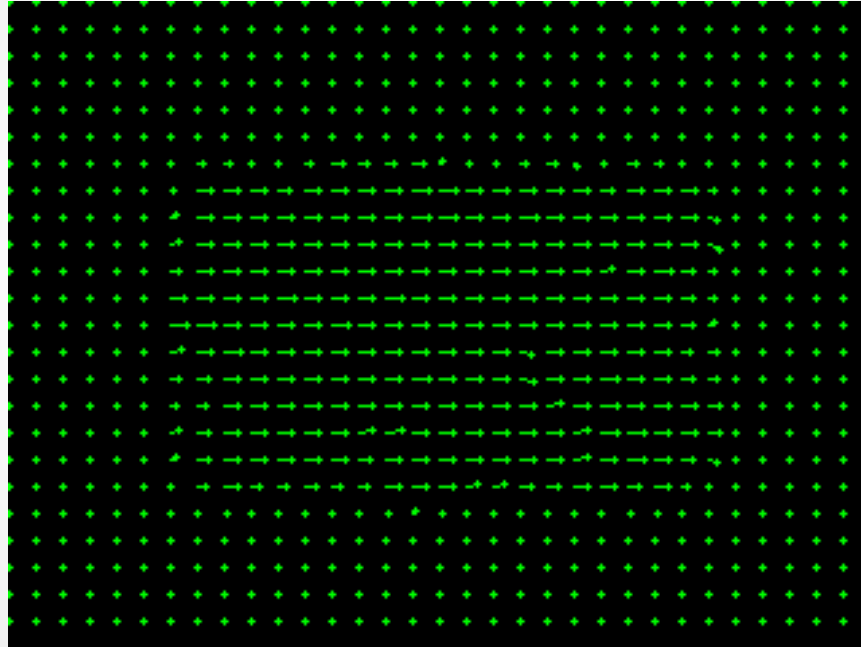


Computer Vision (Spring 2019) Problem Set #4

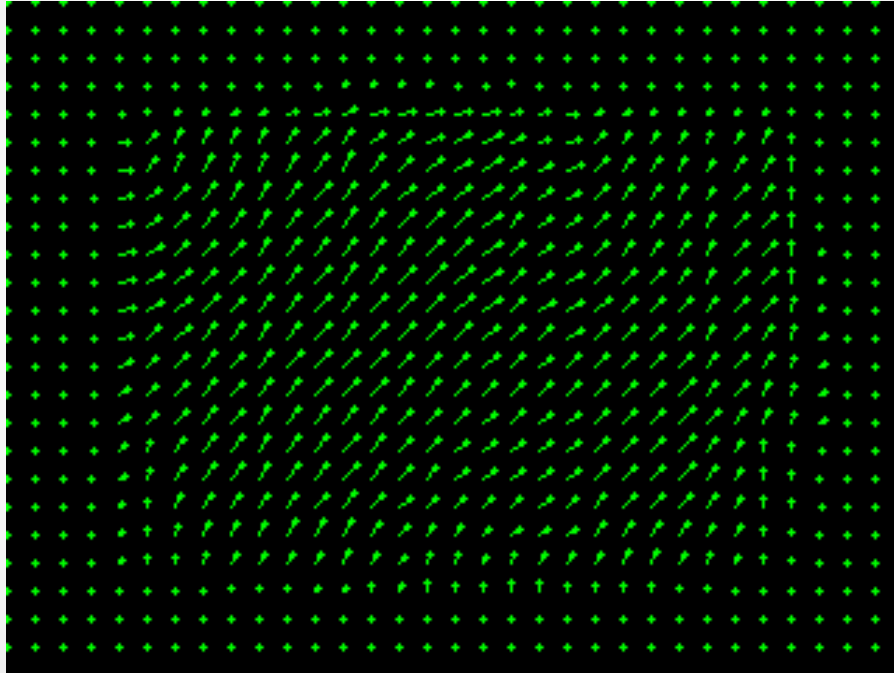
Alon Amar
aamar32@gatech.edu

1a: Base Shift0 and ShiftR2



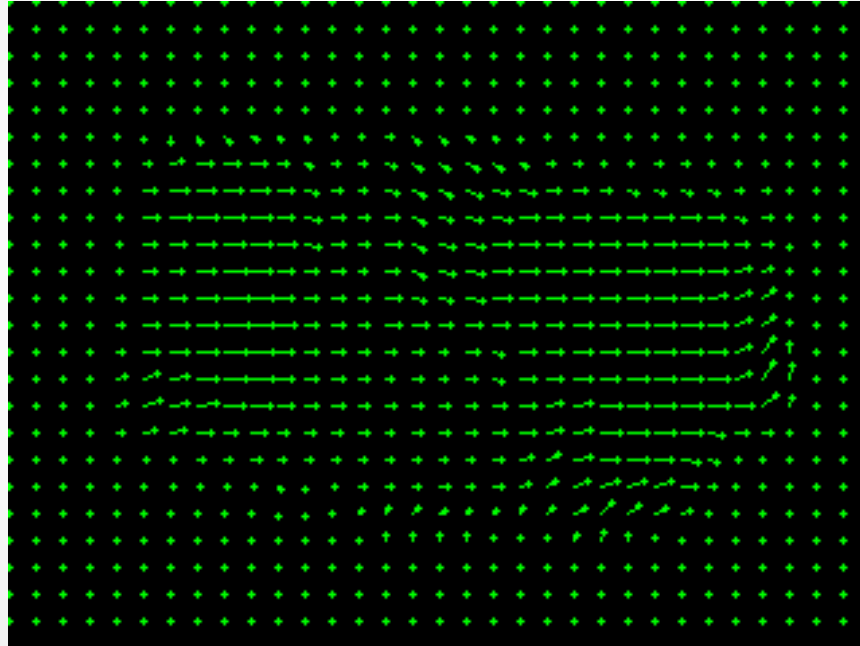
ps4-1-a-1

1a: Base Shift0 and ShiftR5U5



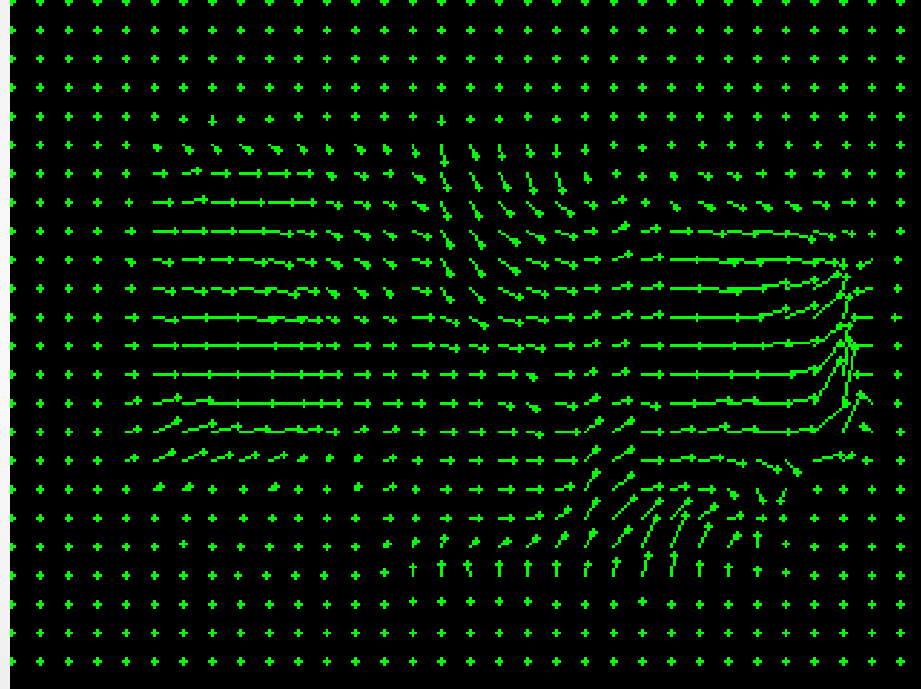
ps4-1-a-2

1b: Base Shift0 and ShiftR10



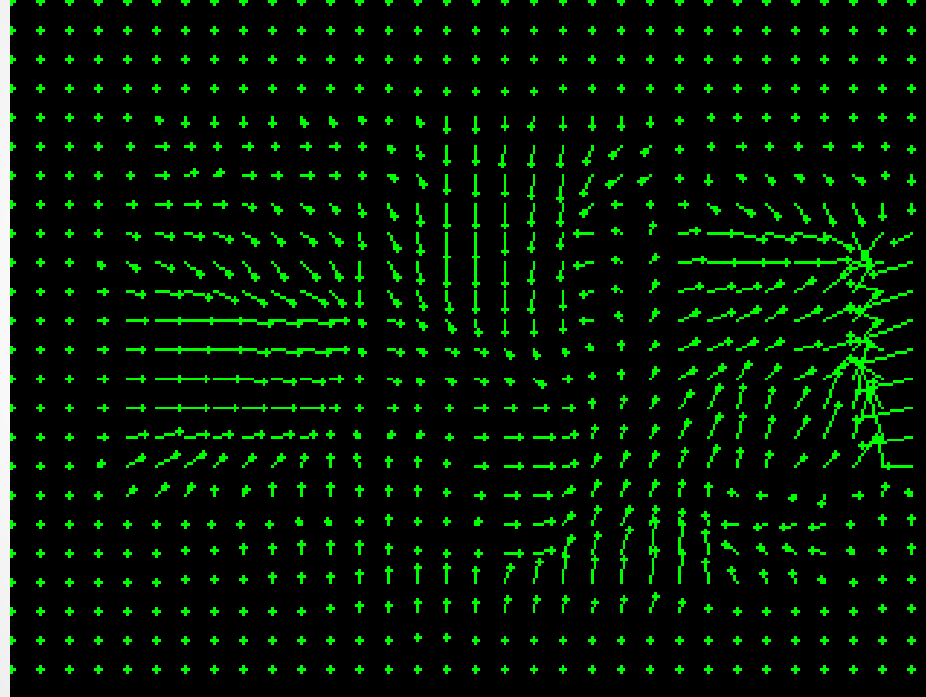
ps4-1-b-1

1b: Base Shift0 and ShiftR20



ps4-1-b-2

1b: Base Shift0 and ShiftR40



ps4-1-b-3

1b: Text Response

Does LK still work? Does it fall apart on any of the pairs? Try using different parameters to get results closer to the ones above. Describe your results and what you tried.

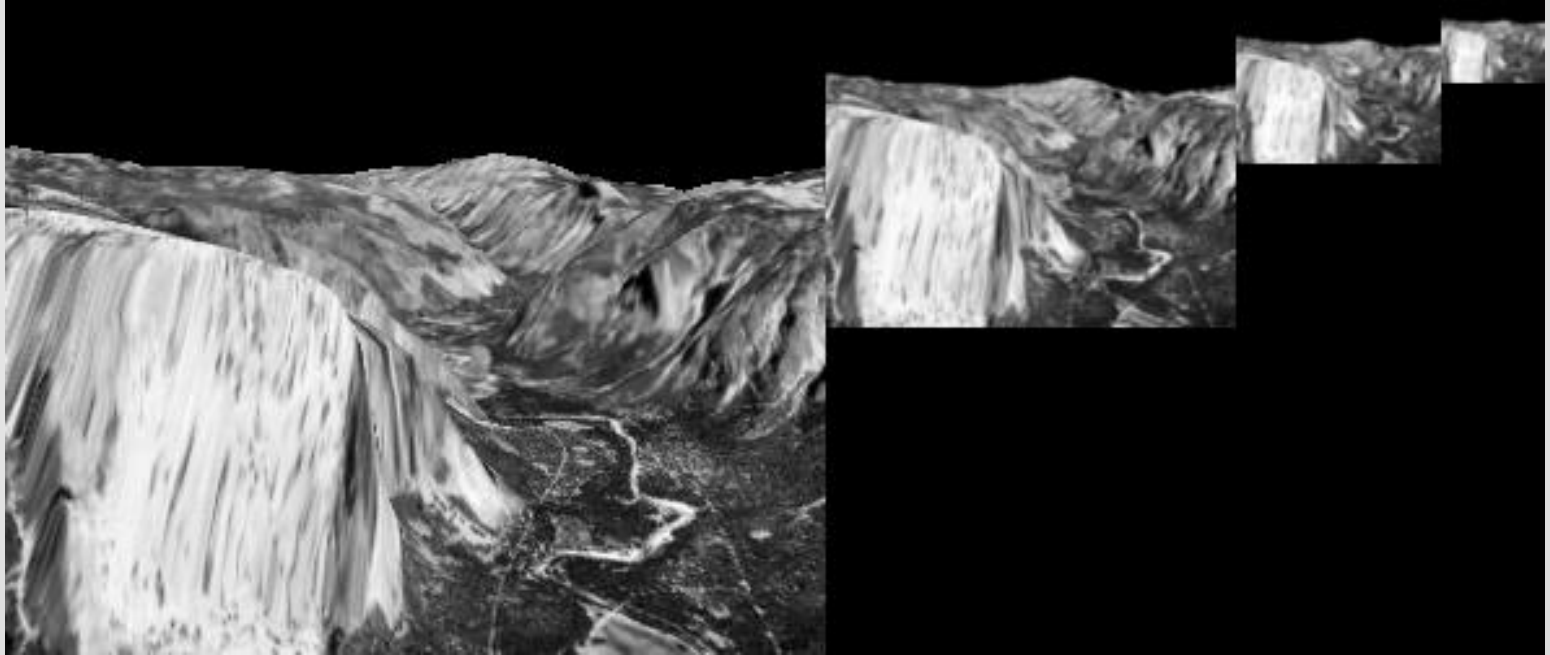
Not really.

Since LK is relying on small changes, the bigger the change, the less it is going to perform well.

We can see it clearly for the last pair, how it was unable to find the correct (u,v) for a big chunk of the image.

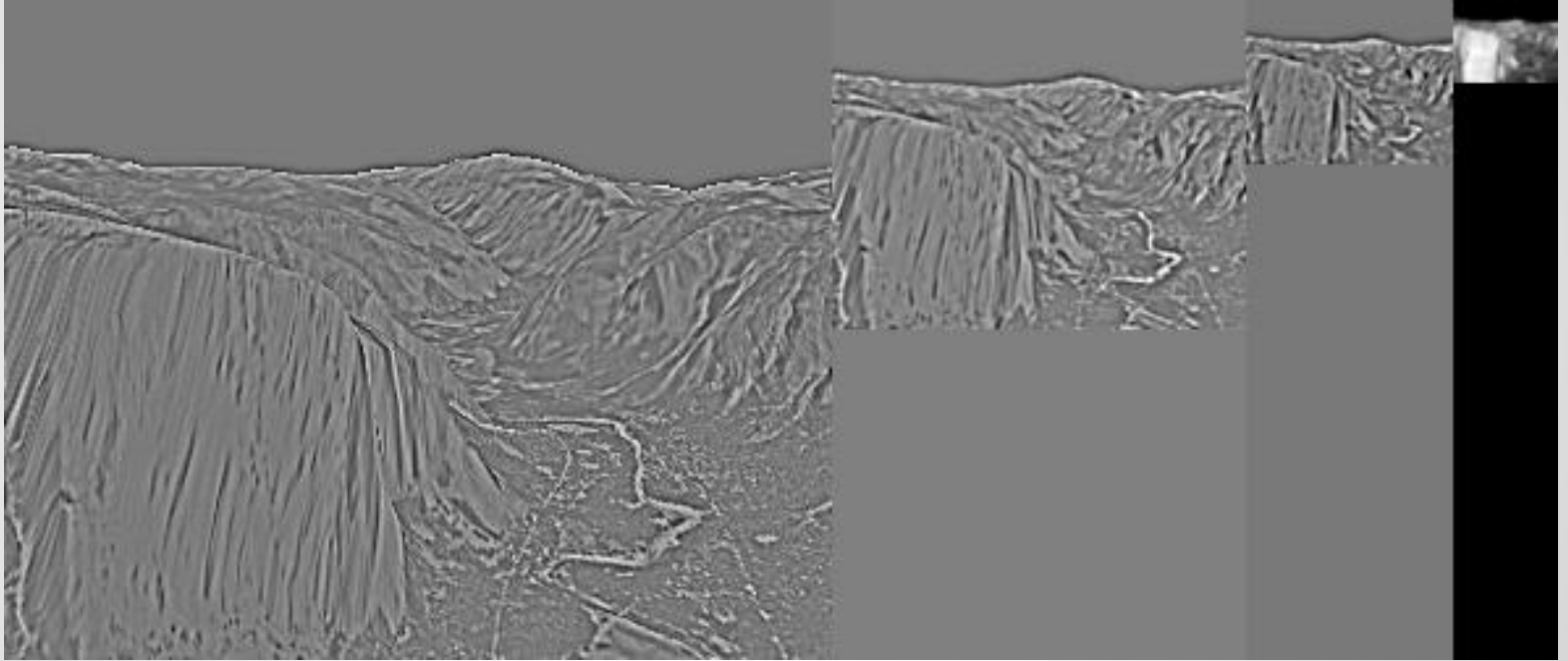
On the first attempt, it was even worse for all images. I methodically increased the size of the kernel, and had to use a gaussian blur. At the end, I used a pretty big gaussian blur (29 with sigma 17) and a big kernel (>50) to get it to show the correct motion. By doing so, I basically numbed the image to a big blurry hodgepodge.

2a: Gaussian Pyramid



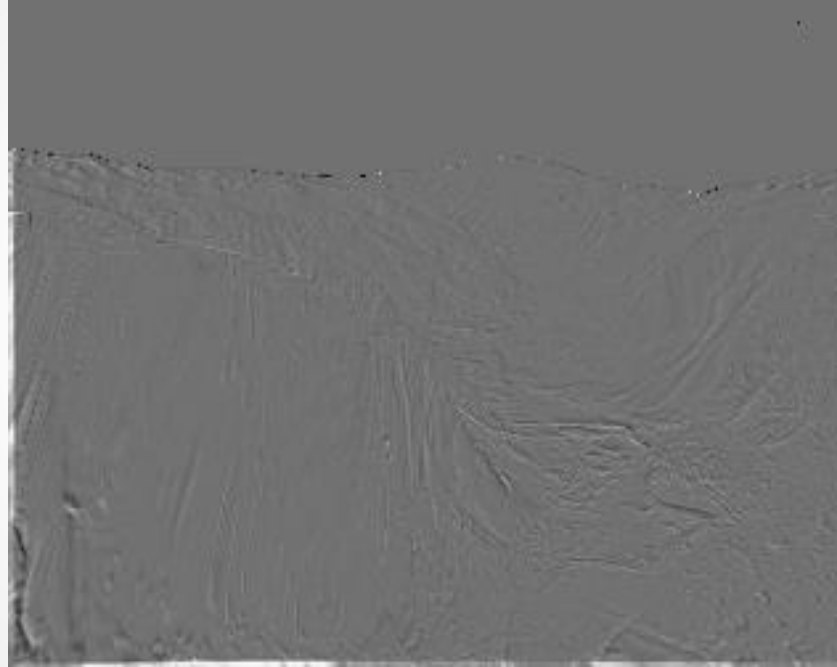
ps4-2-a-1

2b: Laplacian Pyramid



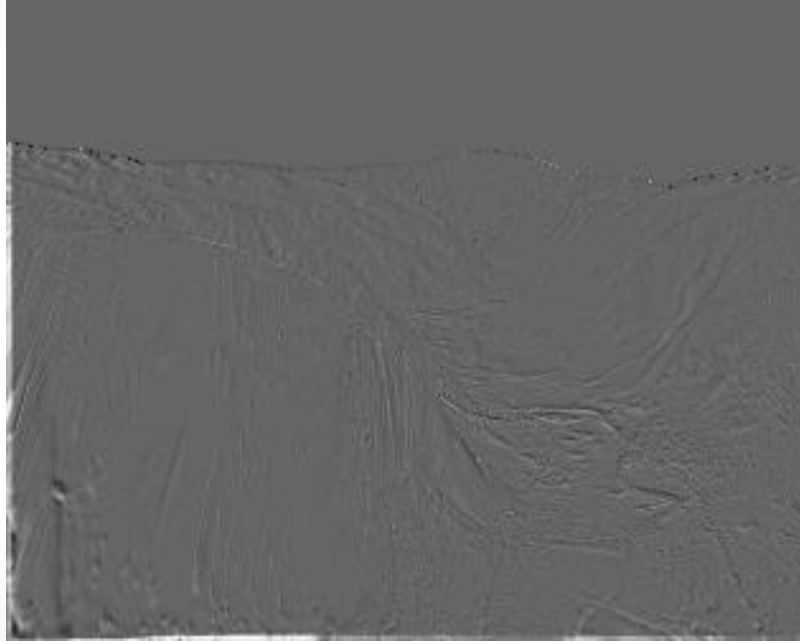
ps4-2-b-1

3a: Difference images



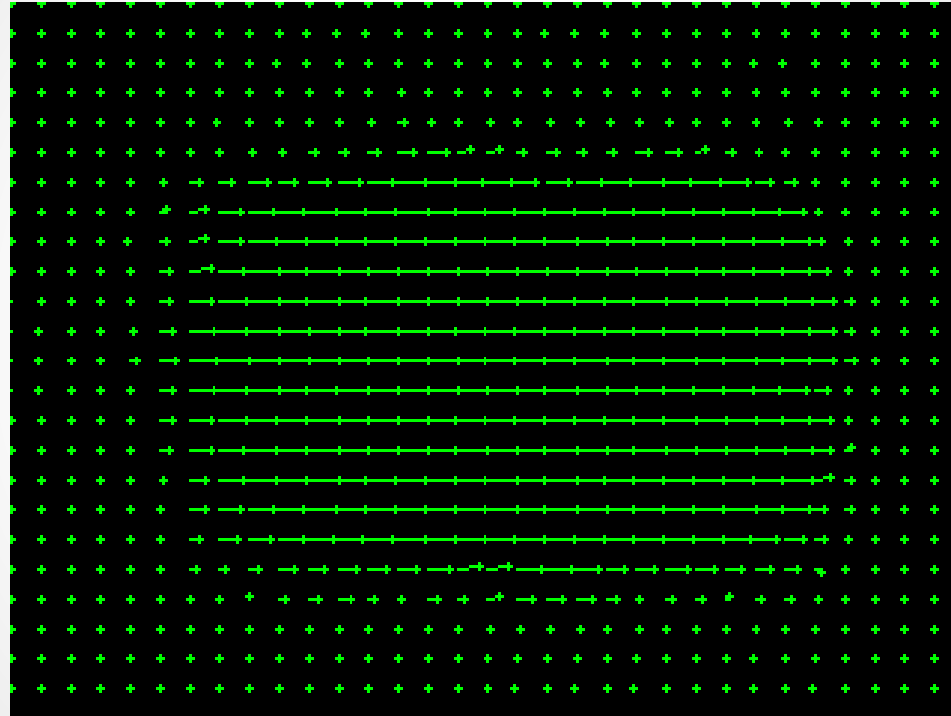
ps4-3-a-1

3a: Difference images (cont.)



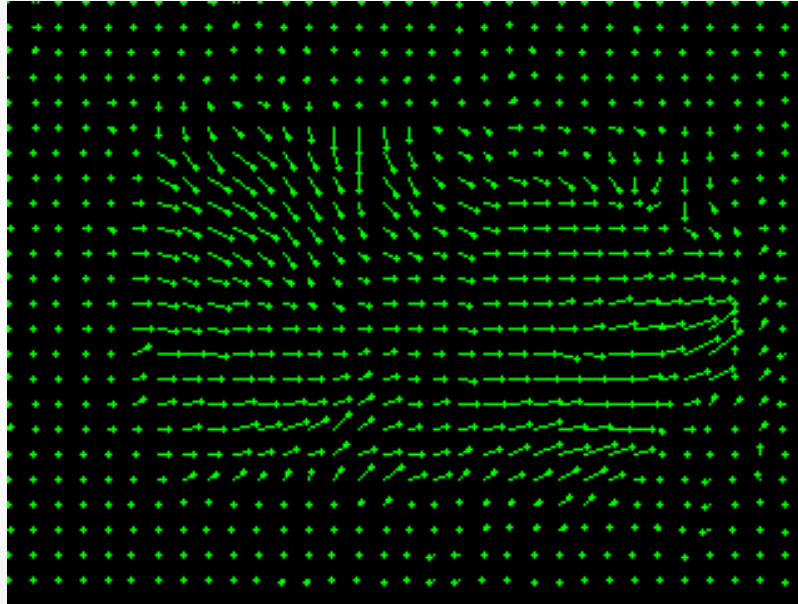
ps4-3-a-2

4a: Hierarchical LK



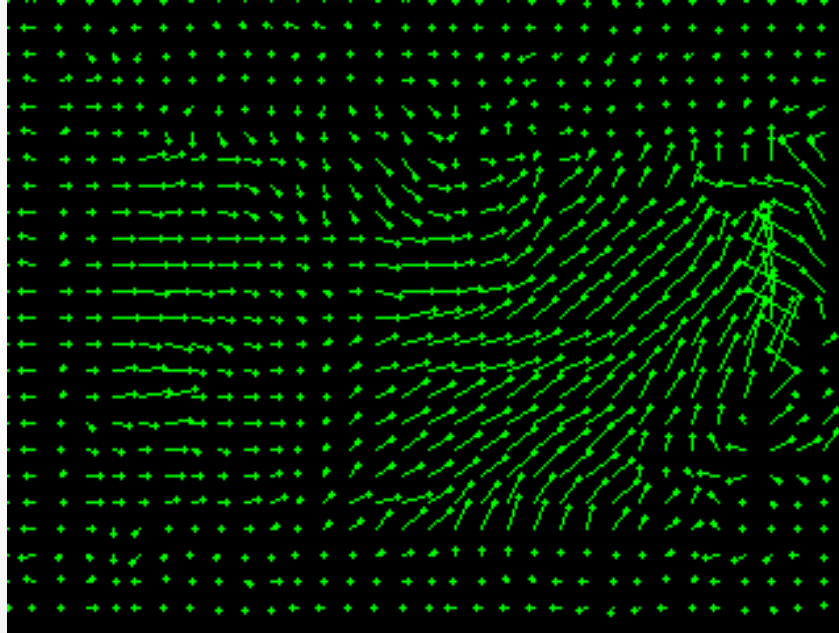
ps4-4-a-1

4a: Hierarchical LK (cont.)



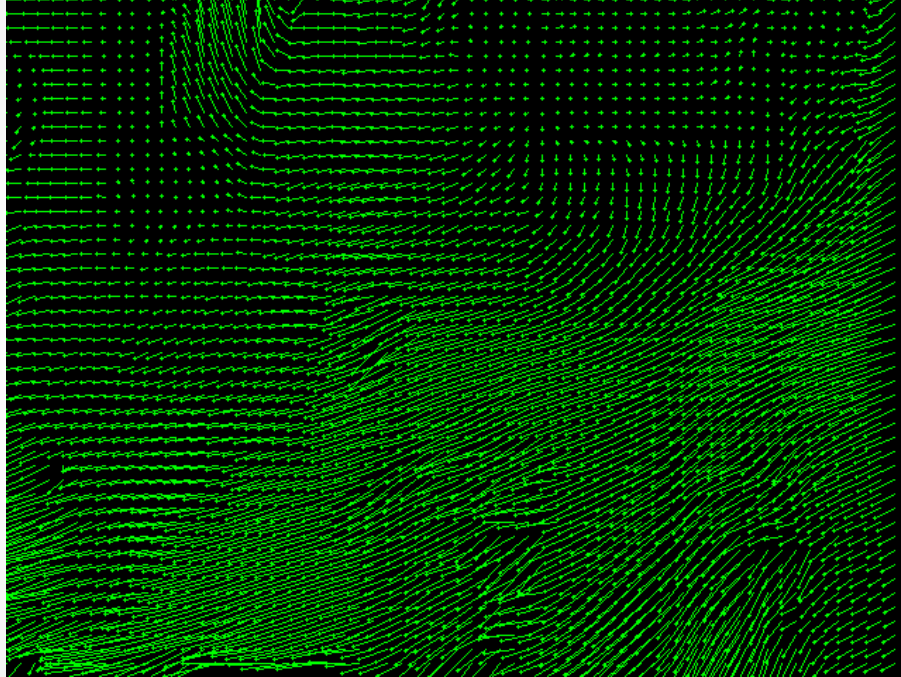
ps4-4-a-2

4a: Hierarchical LK (cont.)



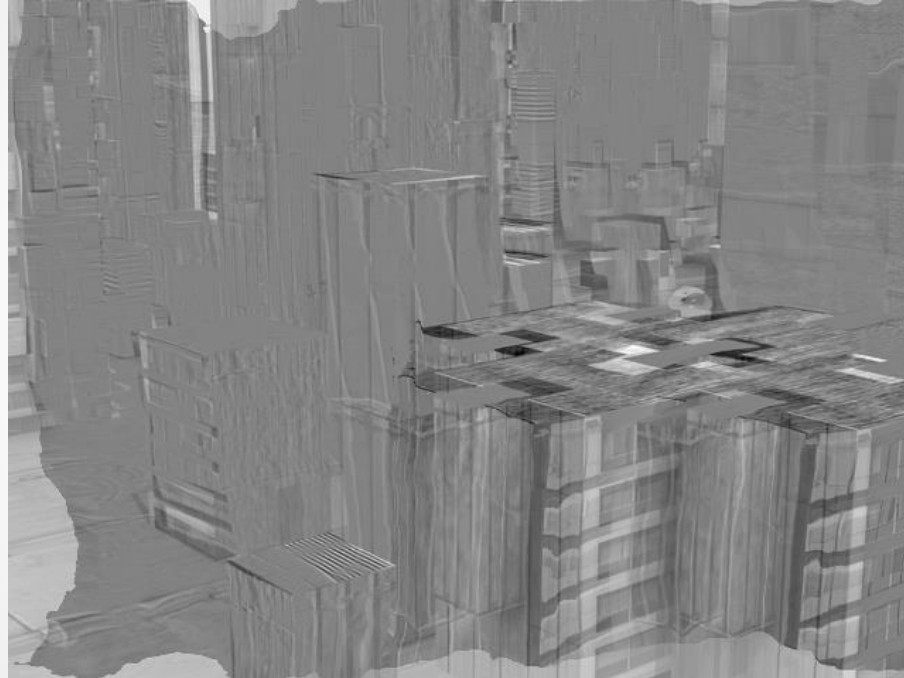
ps4-4-a-3

4b: Hierarchical LK (cont.)



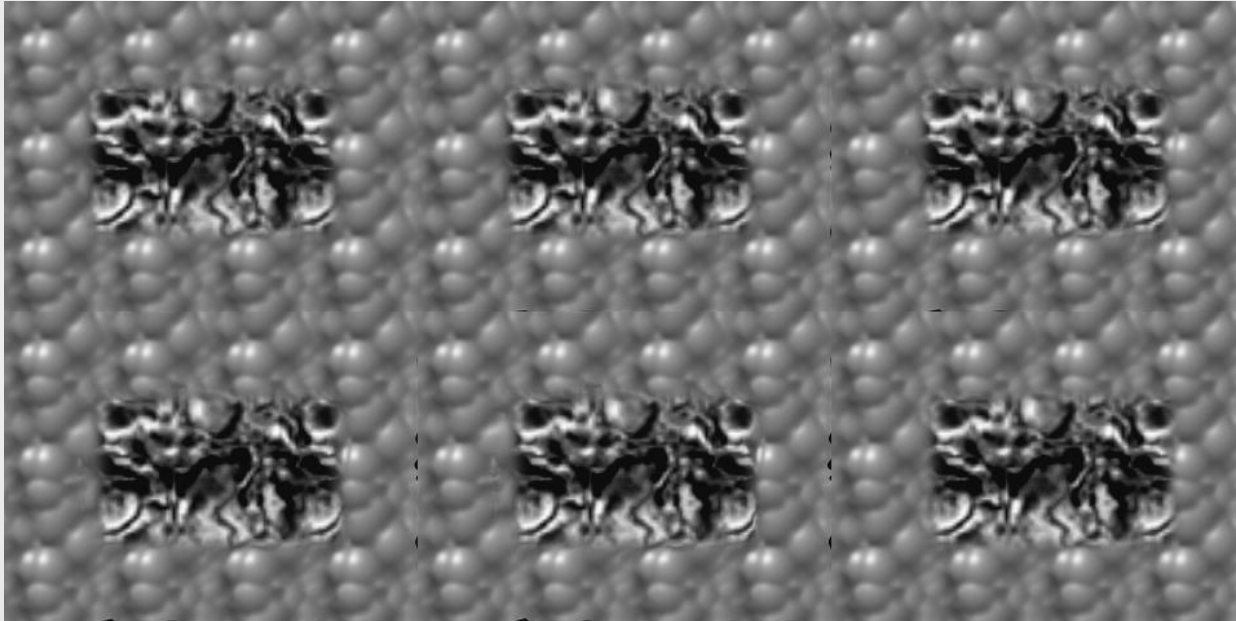
ps4-4-b-1

4b: Hierarchical LK (cont.)



ps4-4-b-2

5a: Frame Interpolation



ps4-5-a-1

5b: Frame Interpolation



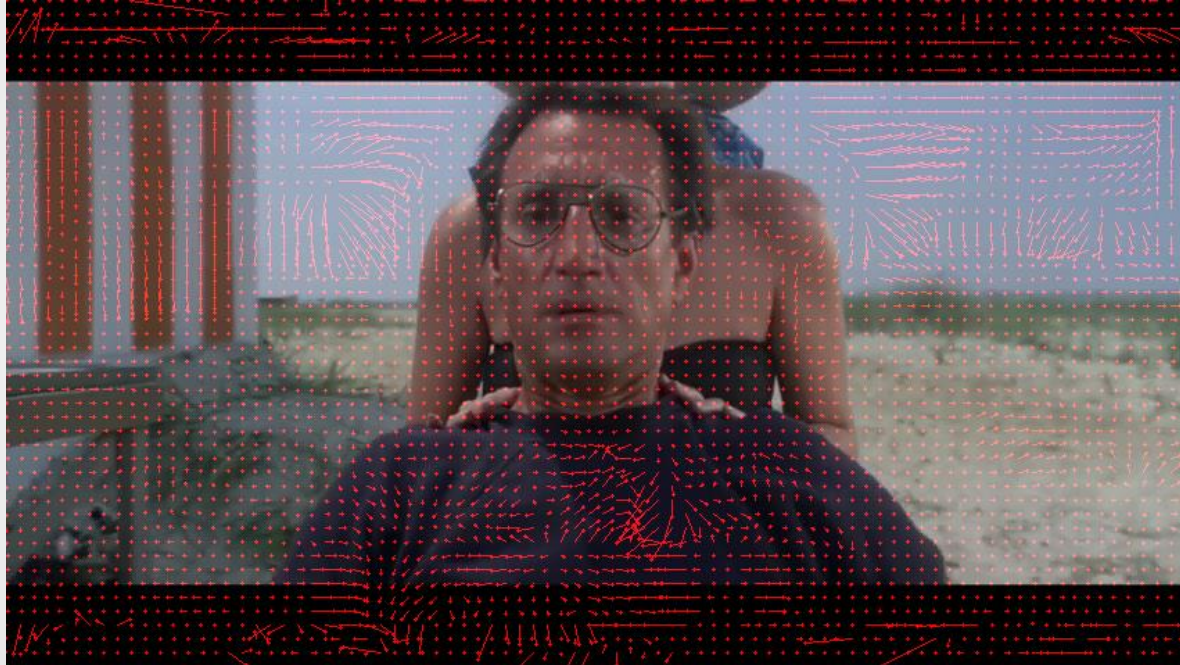
ps4-5-b-1

5b: Frame Interpolation



ps4-5-b-2

6: Challenge Problem



ps4-6-a-1

6: Challenge Problem (cont.)



ps4-6-a-2

6: Challenge Problem (cont.)

Video link:

<https://youtu.be/WBxkpRue0jw>