

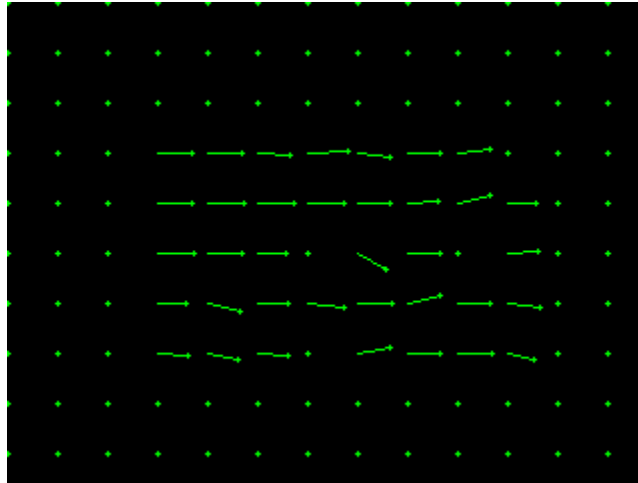
Computer Vision

Spring 2018

Problem Set #4

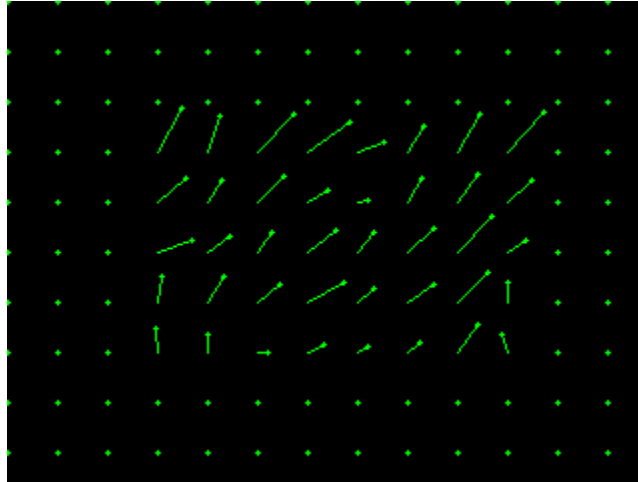
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1a: Base Shift0 and ShiftR2



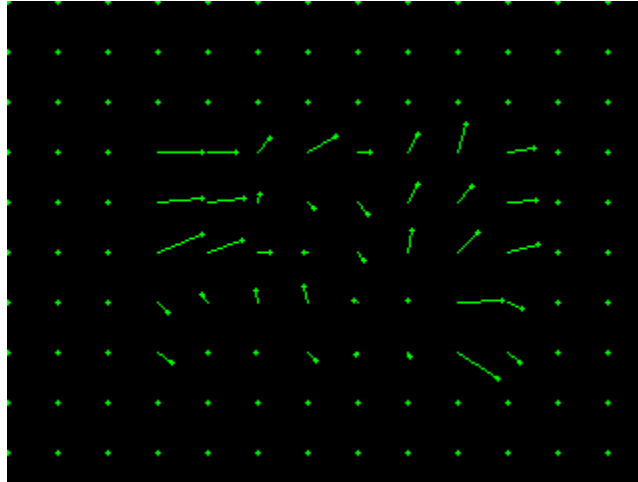
ps4-1-a-1.png

1a: Base Shift0 and ShiftR5U5



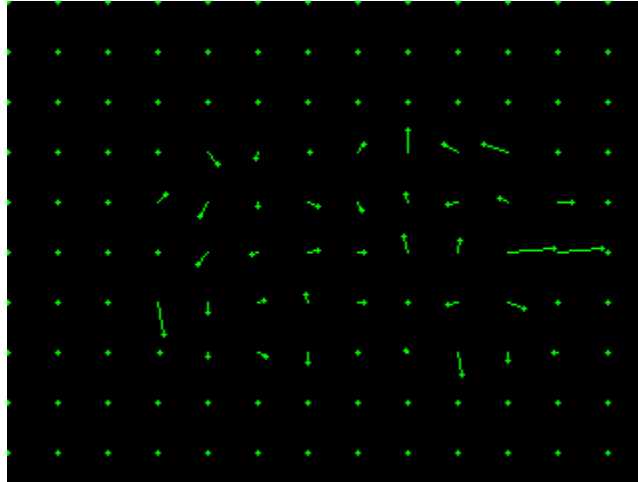
ps4-1-a-2.png

1b: Base Shift0 and ShiftR10



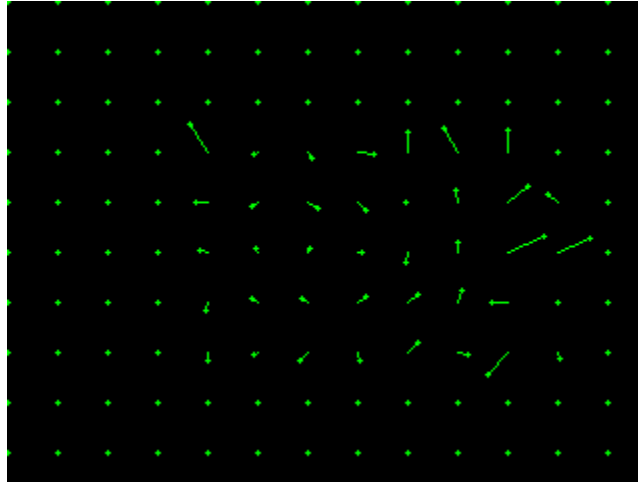
ps4-1-b-1.png

1b: Base Shift0 and ShiftR20



ps4-1-b-2.png

1b: Base Shift0 and ShiftR40



ps4-1-b-3.png

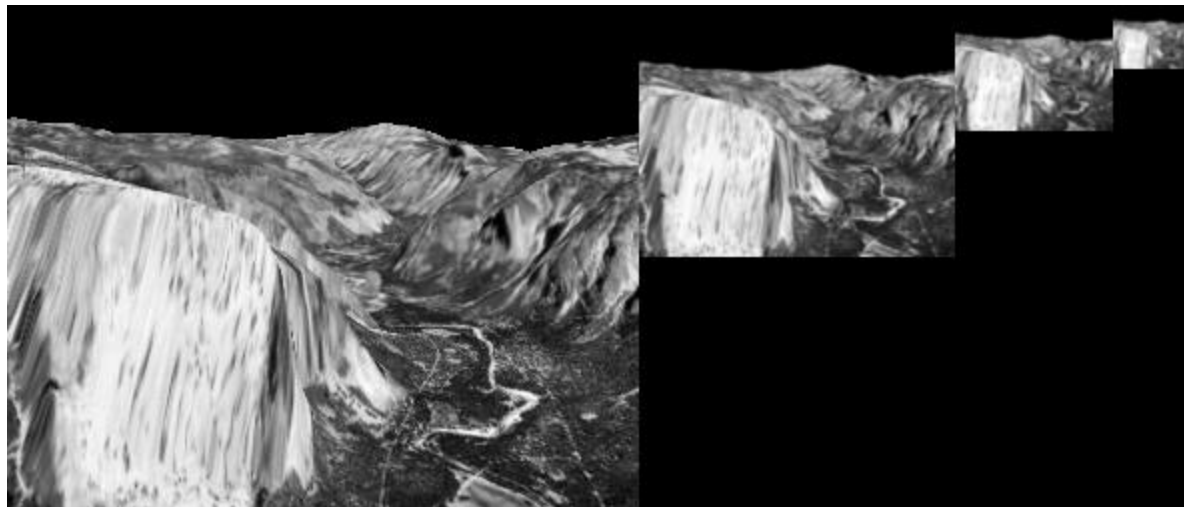
1b: Text Response

- 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.

- Answers:

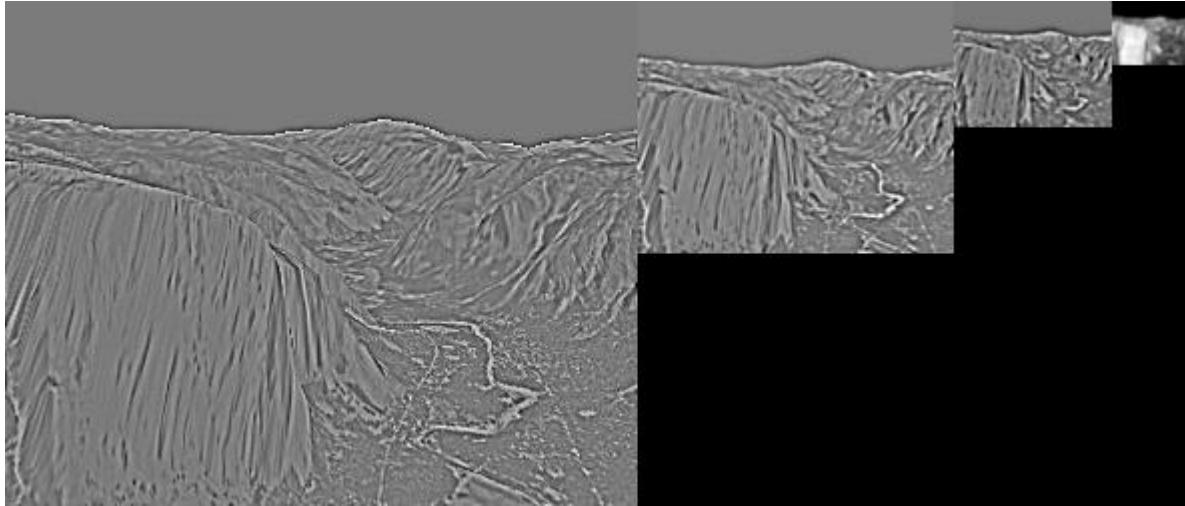
- When the displacement is high, it is hard for the LK method to detect. Especially ShiftR20 and ShiftR40. Gaussian blur size = (15,15) was tried, but not helping.
- An uniform kernel with large `k_size` (= 45) helped slightly to detect ShiftR10, but not helping on ShiftR20 and ShiftR40 with even further increase
- `gradient_x` and `gradient_y` functions were used with `ksize` = 3 and `scale` = 1/8.0, as instructed in the project description

2a: Gaussian Pyramid



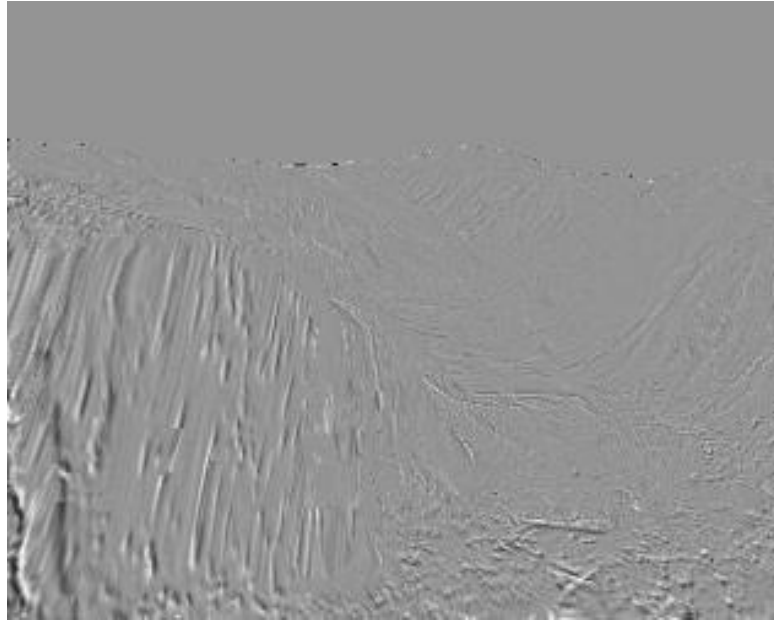
ps4-2-a-1.png

2b: Laplacian Pyramid



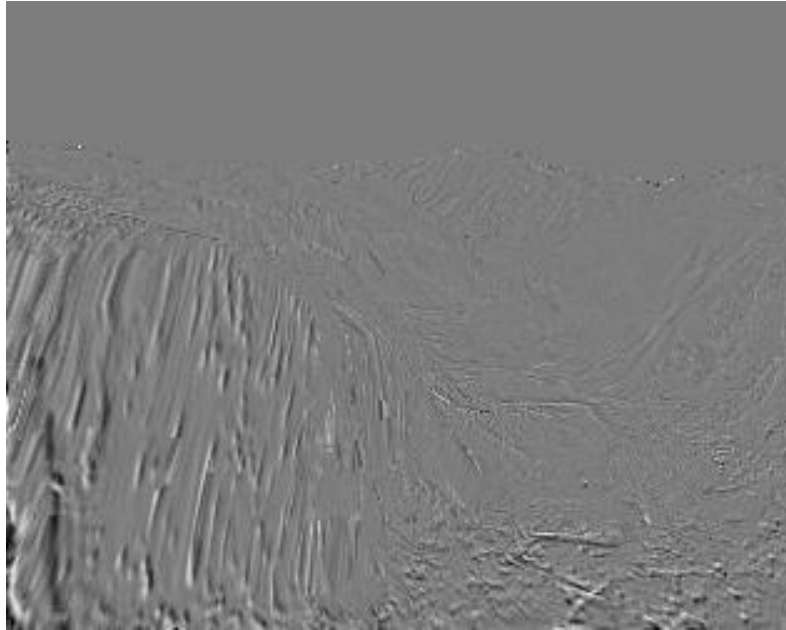
Laplacian Pyramid Image - **ps4-2-b-1.png**

3a: Difference images



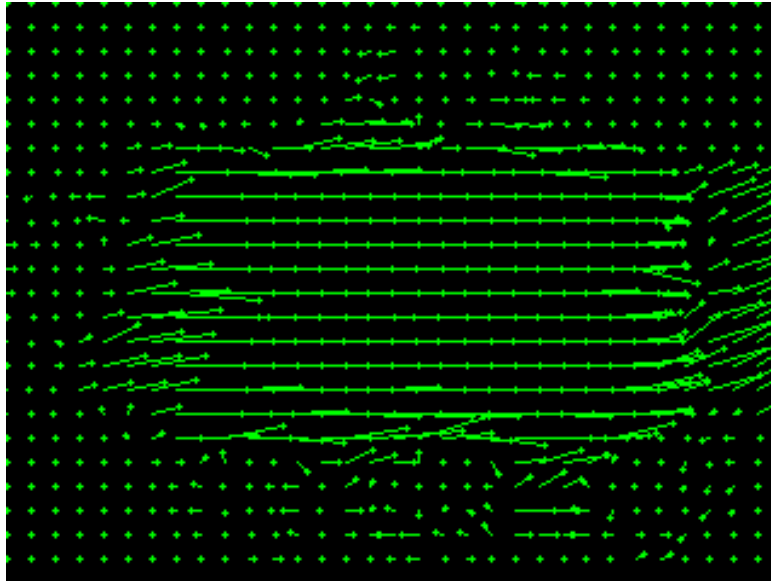
ps4-3-a-1.png

3a: Difference images (cont.)



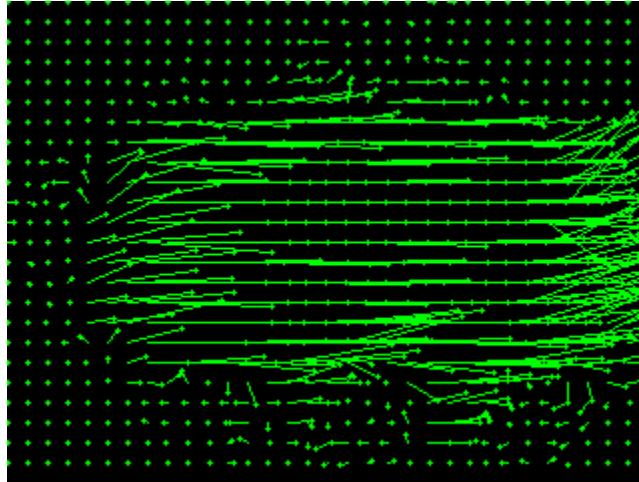
ps4-3-a-2.png

4a: Hierarchical LK



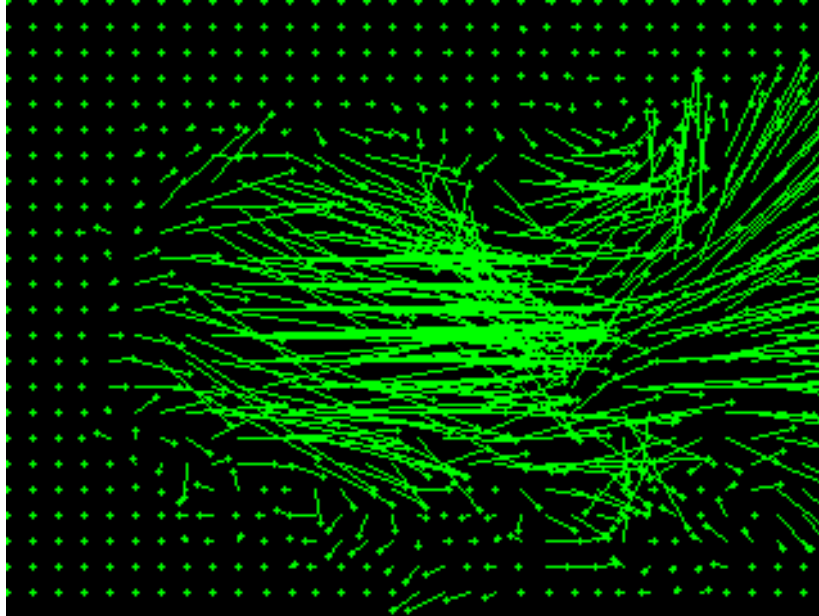
ps4-4-a-1.png

4a: Hierarchical LK (cont.)



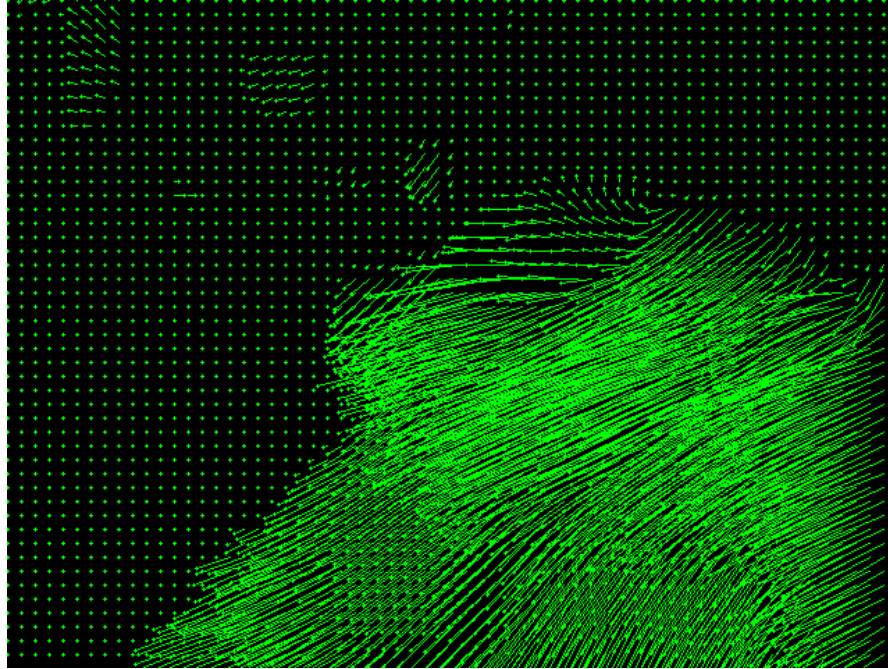
ps4-4-a-2.png

4a: Hierarchical LK (cont.)



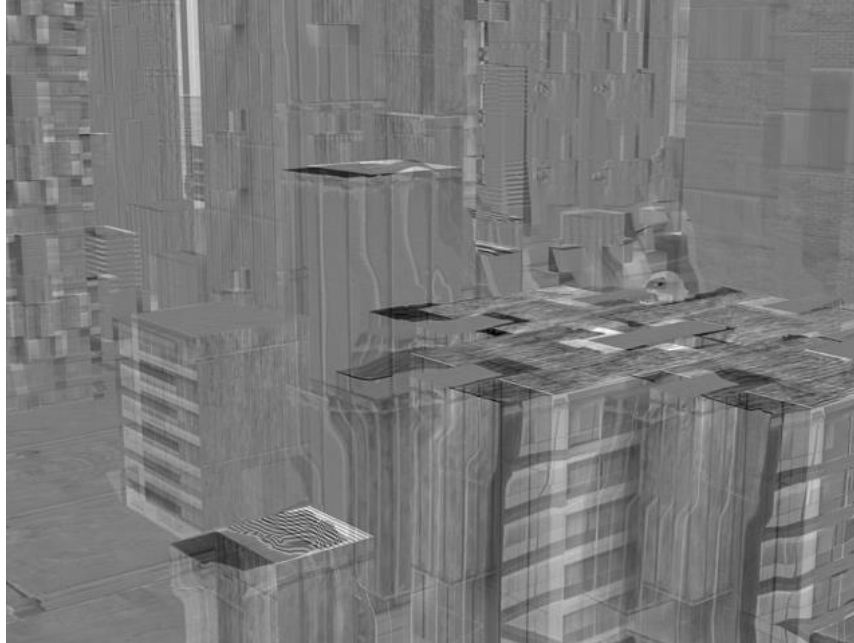
ps4-4-a-3.png

4b: Hierarchical LK (cont.)



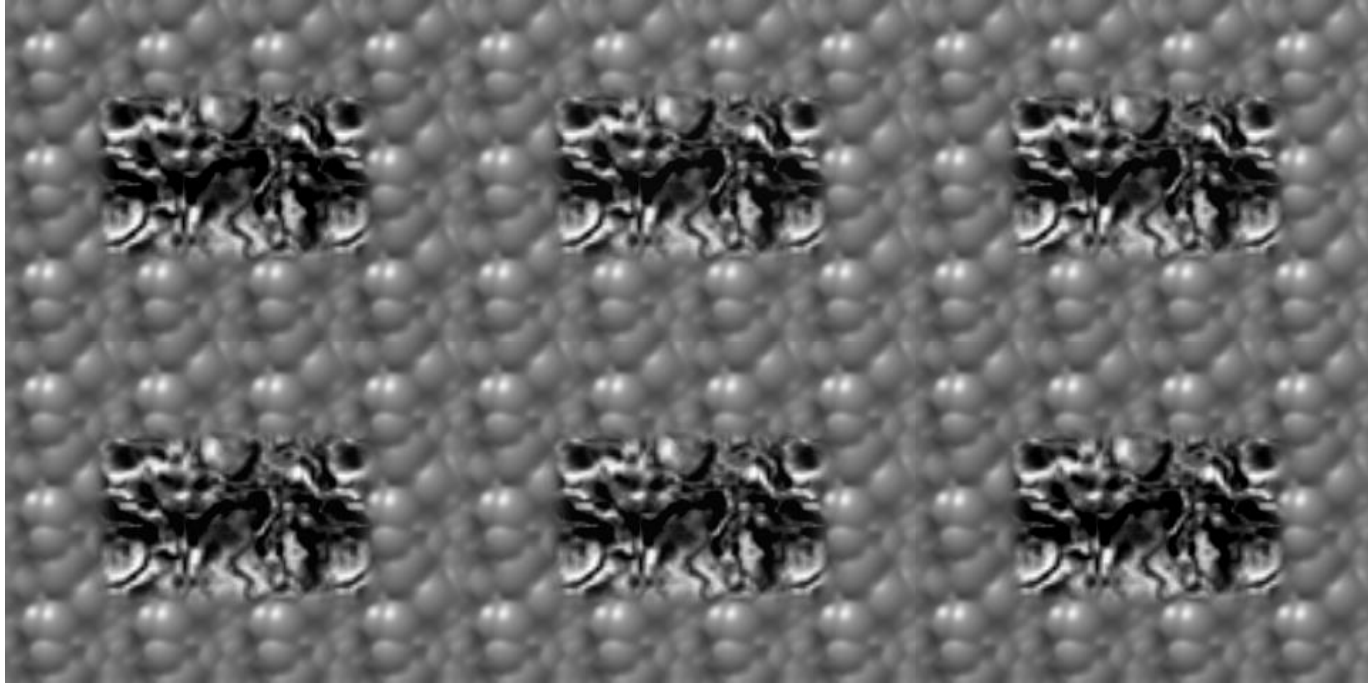
ps4-4-b-1.png

4b: Hierarchical LK (cont.)



ps4-4-b-2.png

5a: Frame Interpolation



ps4-5-a-1.png

5b: Frame Interpolation



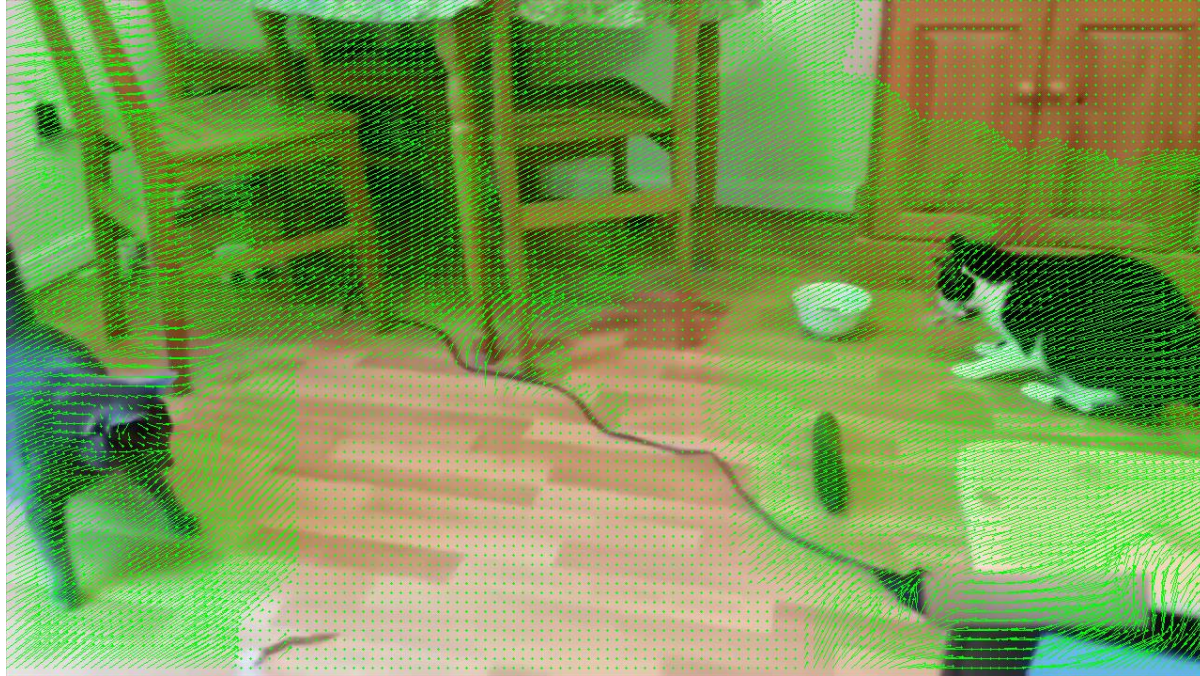
ps4-5-b-1.png

5b: Frame Interpolation



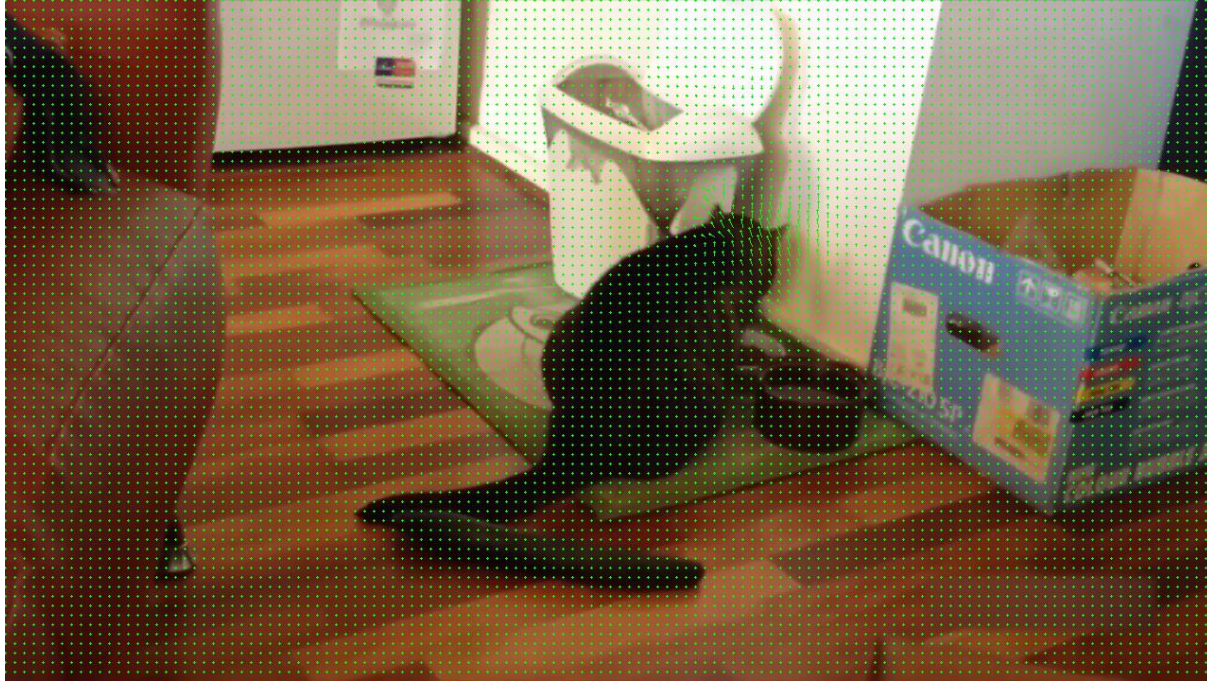
ps4-5-b-2.png

6: Challenge Problem



ps4-6-a-1.png

6: Challenge Problem (cont.)



ps4-6-a-2.png

6: Challenge Problem (cont.)

https://youtu.be/_cXrhyEiJNk

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Verify that all images are still visible for grading.