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CS 445 - Project 5: Image Based Lighting

Complete the claimed points and sections below.

Total Points Claimed **[ ] / 250**

Core

1. Stitch two key frames [ ] / 20
2. Panorama using five key frames [ ] / 15
3. Map the video to the reference plane [ ] / 15
4. Create background panorama [ ] / 15
5. Create background movie [ ] / 10
6. Create foreground movie [ ] / 15
7. Quality of results and report [ ] / 10

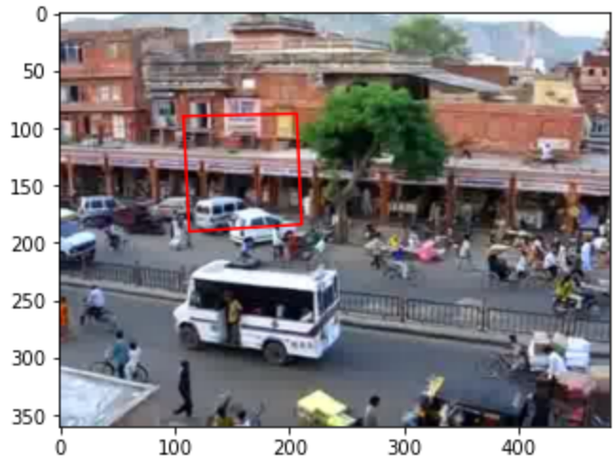
B&W

8. Insert unexpected object [ ] / 15
9. Process your own video [ ] / 20
10. Smooth blending [ ] / 30
11. Improved fg/bg videos [ ] / 40
12. Generate a wide video [ ] / 10
13. Remove camera shake [ ] / 20
14. Make streets more crowded [ ] / 15

1. Stitch two key frames

Include

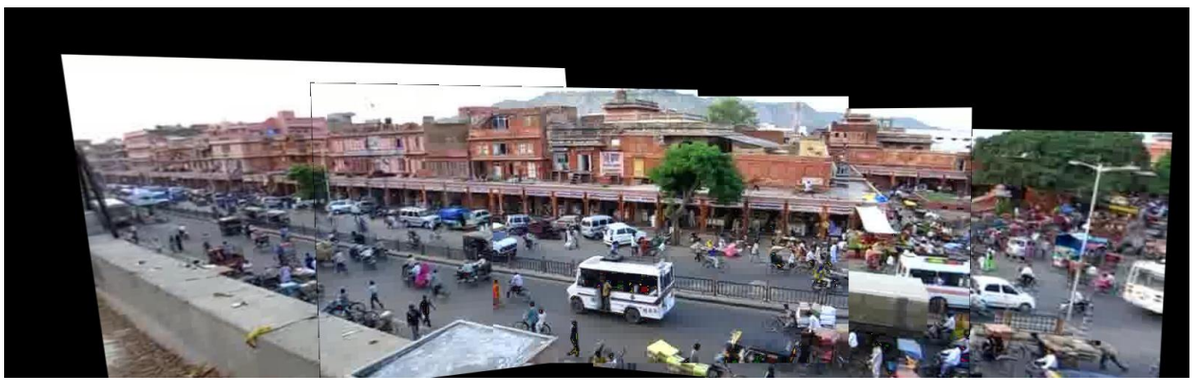
- Display of image frames 270 and 450 with the red plot lines showing corresponding regions
- Printout of 3x3 homography matrix normalized so that the largest value is 1



[[1.00000000e+00 5.39492659e-02 -2.05333612e+02]
 [1.43775519e-02 9.46163427e-01 -1.56209124e+01]
 [3.95223112e-04 5.82436763e-05 8.05916549e-01]]

2. Panorama using five key frames

Include your panoramic image



3. Map the video to the reference plane

Include:

- Link to your video
- Display frame 200 of your video

- Briefly explain how you solved for the transformation between each frame and the reference frame

Video: See part3.mpeg

Frame 200:

Transformation:

To map frames that are too far from frame 450, we first map it onto the closest keyframe, where the keyframe is one of the 90, 270, 450, 630, and 810 frames. The homography matrix is then computed via the dot product of the two mappings.

4. Create the background panorama

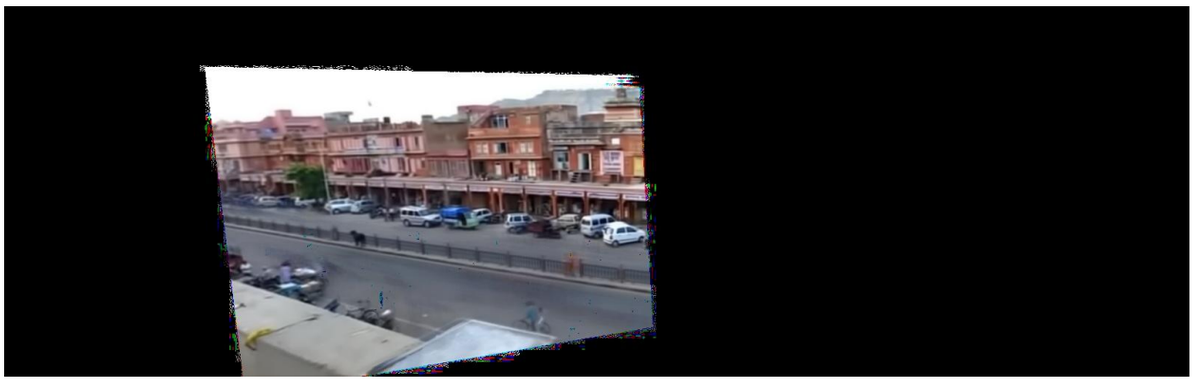
Include:
- Picture of the background panorama
- Explain your method of computing the background color of a pixel

To find the correct value of the pixel, we find among all the frames from part 3 the dominant color. Such color is found via finding the median.

5. Create the background movie

Include:
- Link to your video
- Display frame 200 of your video

See part5.mpeg



6. Create the foreground movie

Include:

- Link to your video
- Display frame 200 of your video

See part6.mpeg

7. Quality of results / report

Nothing extra to include (scoring: 0=poor 5=average 10=great).

8. Insert unexpected object

Include link to your video.

9. Process your own video

Include:

- Background image
- Link to background video
- Link to foreground video

10. Smooth blending

Include panoramic image from part 2 with better blending

11. Smooth blending

Include panoramic image from part 2 with better blending

12. Generate a wide video

Include link to your video

13. Remove camera shake

Include link to your stabilized video

14. Make street more crowded

Include link to your video

Acknowledgments / Attribution

List any sources for code or images from outside sources