Computer Vision HW3

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Part 1

I used Solution 2 (confining h11 2 + … + h33 2 = 1 through the use of SVD).



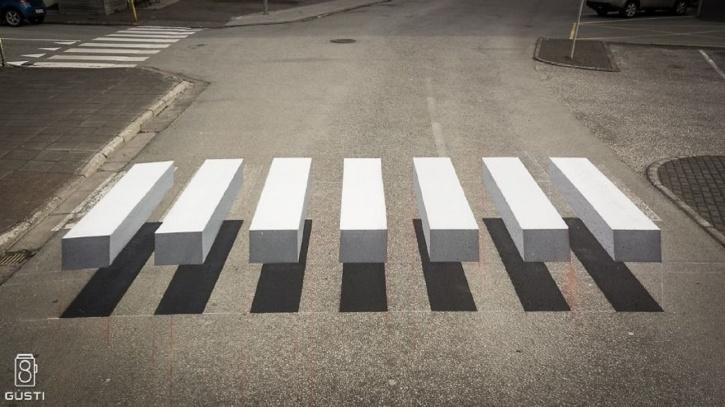


Part 2

Decoded link: <http://media.ee.ntu.edu.tw/courses/cv/18F/>

Part 3

I did not get parallel bars from the top view, with the left-most bar noticeably out of place. When I analyzed the original image, I discovered that the left-most bar is not parallel to the other bars’ top and bottom sides to begin with (as shown with the added black lines), so it makes sense that it would veer off to the side after transformation.



Bonus

I have already included the output video bonus.mp4.

To run code for the bonus section, copy ar\_marker.mp4 into B04901117/input/, then execute bonus.py under the B04901117/ folder (the other required input files are already in the B04901117/input/ folder).

The algorithm I used is shown below. First I extract SIFT features, then use a faster version of KNN to match feature points. If the number of feature point pairs which have a low distance score is high enough, I use these feature points to calculate the homographic matrix M. I then warp my custom image using M, and overlay it on the original video frame.

To decrease video processing time, I divided both the video length and width by 5.

