Homework 3

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Introduction to Signal and Image Processing

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1 RANSAC - [3 Points]

1.3: *Edge map*
The choice of the different σ has been made by trying out different values until the edges are clearly distinguishable. It is a trade-off between having many edges and noise.

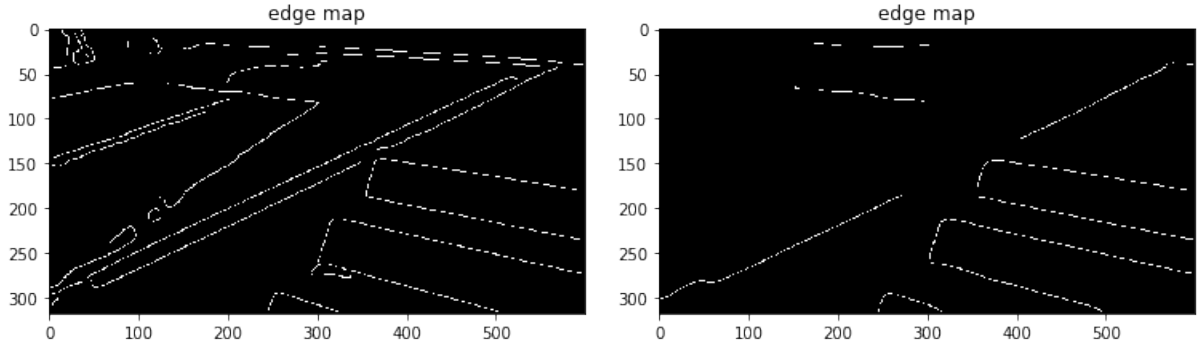

Figure 1: Edges with different values for sigma. Left: $\sigma = 3$ Right: $\sigma = 6$

1.5: *Results*

Note: The randomness of the point selection causes the line to be often different at each execution. For instance, the algorithm often pics one of the stair in the pool picture.

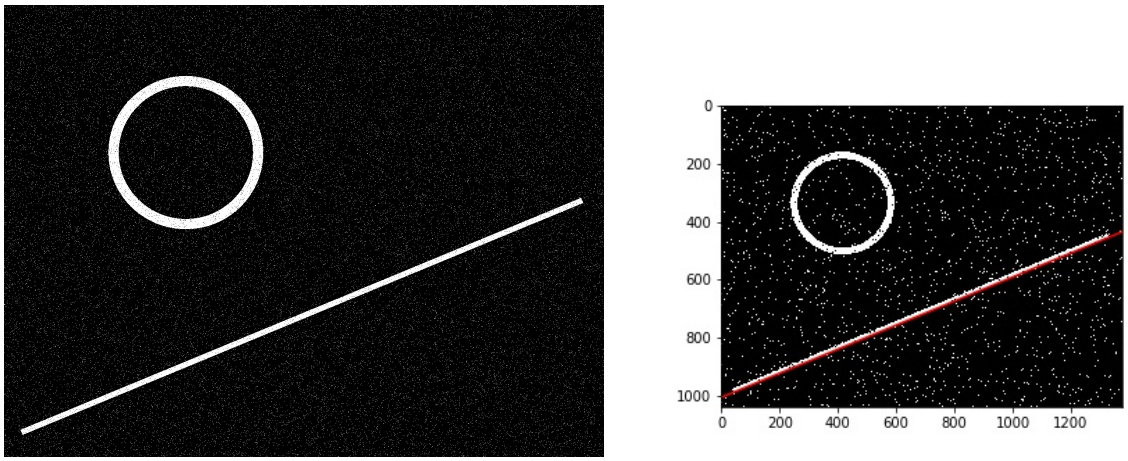

Figure 2: Results for the first synthetic image.

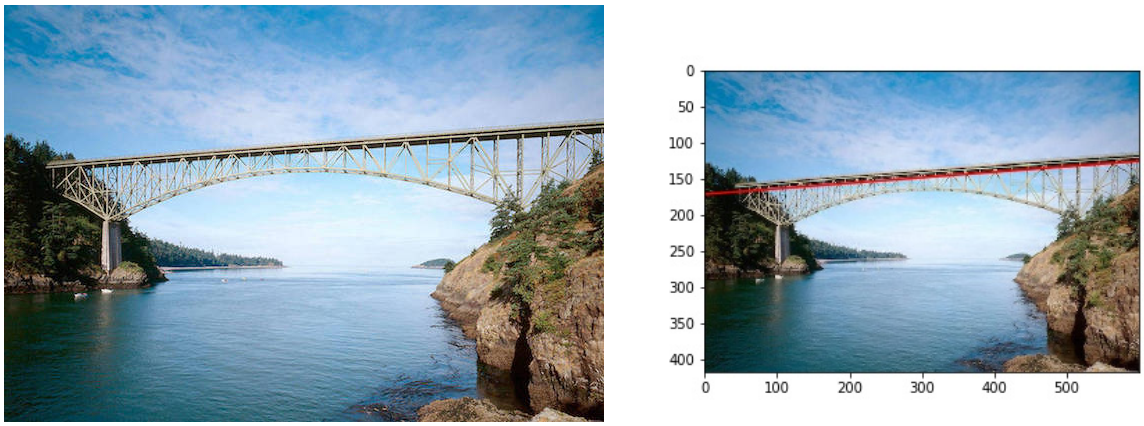

Figure 3: Results for the bridge image.

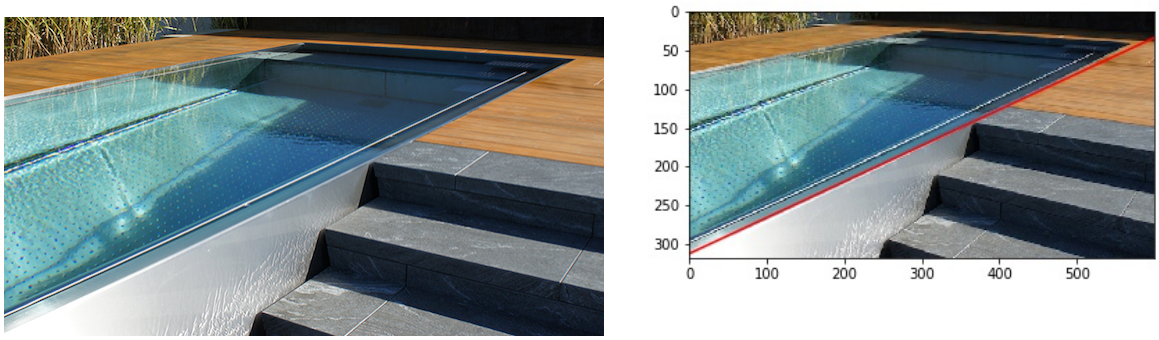

Figure 4: Results for the pool image.

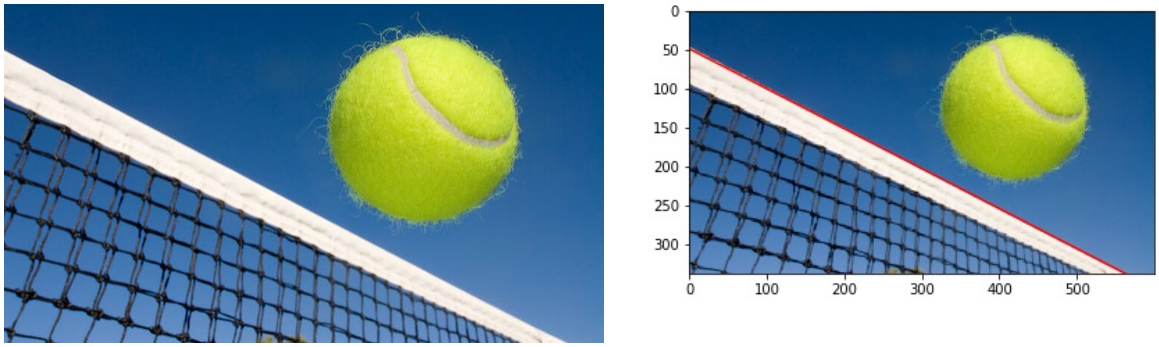

Figure 5: Results for the tennis image.

The results are as expected, beautiful.

2 Texture Synthesis - [4 Points]

Figure 6: Evolution of the first edge region for the Donkey picture.

Figure 7: Fill region before and after an update.

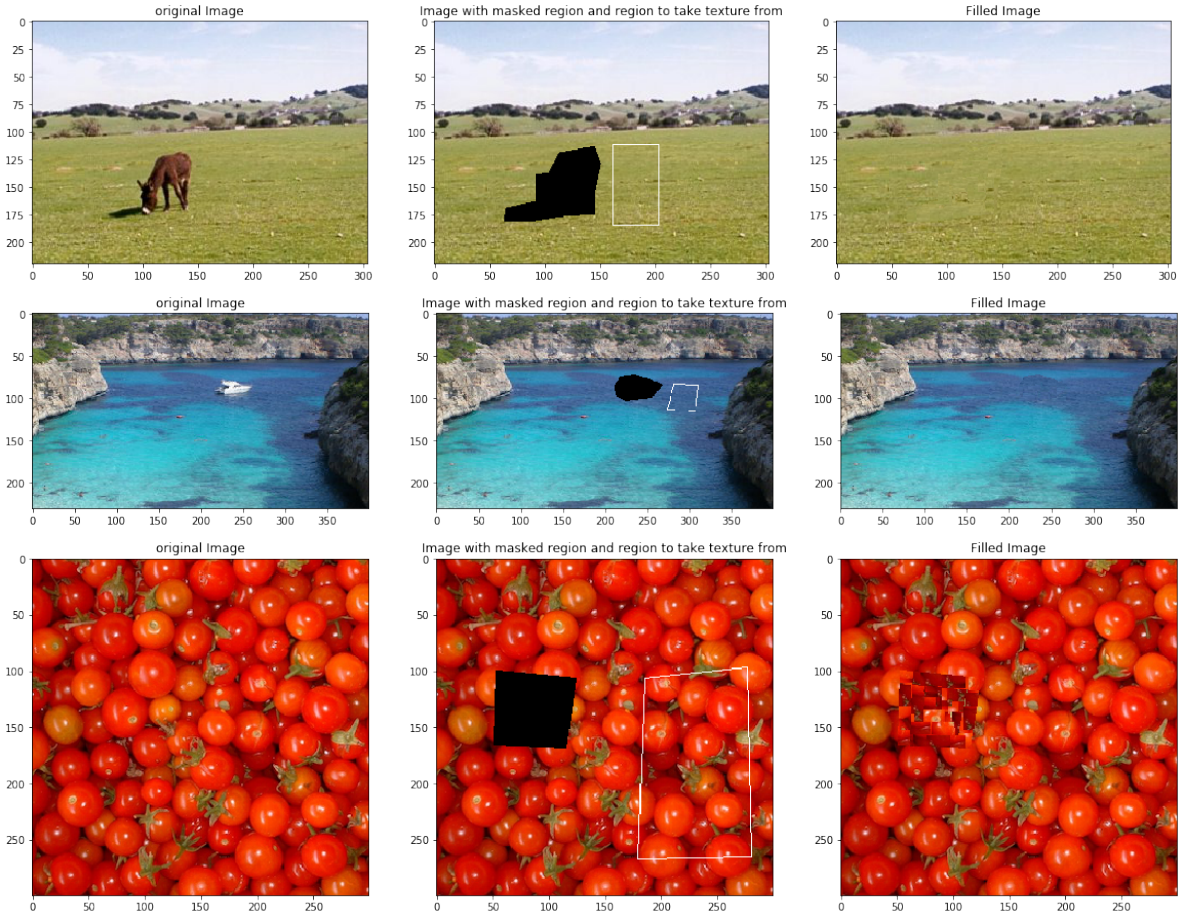

Figure 8: Result of exercise 2.

As specified in the pdf, this technique of copying a whole patch is much faster than the center pixel as suggested in [1]. We are also omitting Gaussian weighted windowing. The results are therefore of inferior quality. This is especially visible for the tomatoes probably due to the fact that the texture has a more complex structure (round fruits with queues as compared as green lines for the grass).

[1] Alexei A Efros and Thomas K Leung. Texture synthesis by non-parametric sampling. In Computer Vision, 1999. The Proceedings of the Seventh IEEE International Conference on, volume 2, pages 1033 - 1038. IEEE, 1999