3D Computer Vision - Homework 4
Disparity Estimation via Graph Cuts

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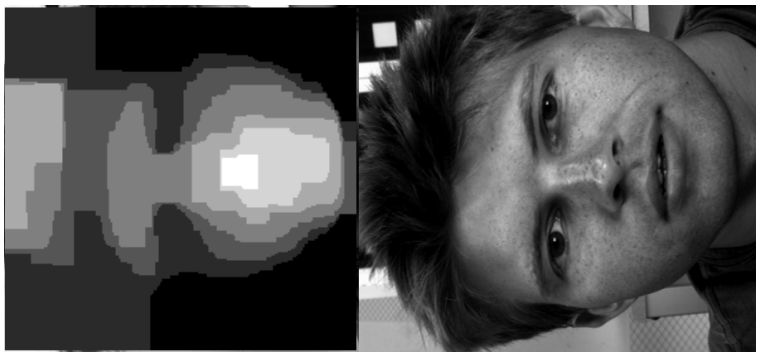
Effect of λ value

λ=0.01

λ= 0.1



λ= 1

The parameter λ controls the smoothness of the solution (it is the coefficient multiplying the regularization term in the energy definition). The default value of λ= 0.1 is actually a good choice that achieves the best results on the tested images. The lowest value used, λ=0.01 gives a really non-smooth solution, as seen in the next figure.

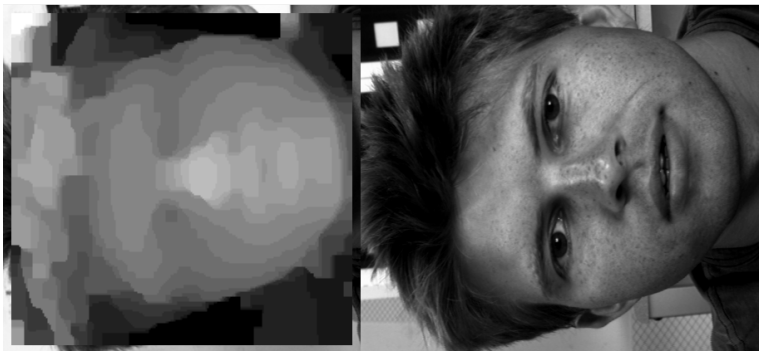
Reconstruction for $\lambda=0.01$

Effect of NCC neighborhood size

Now we fix $\lambda=0.1$ and vary the size of the NCC neighborhood.

$n = 2$

$n = 3$

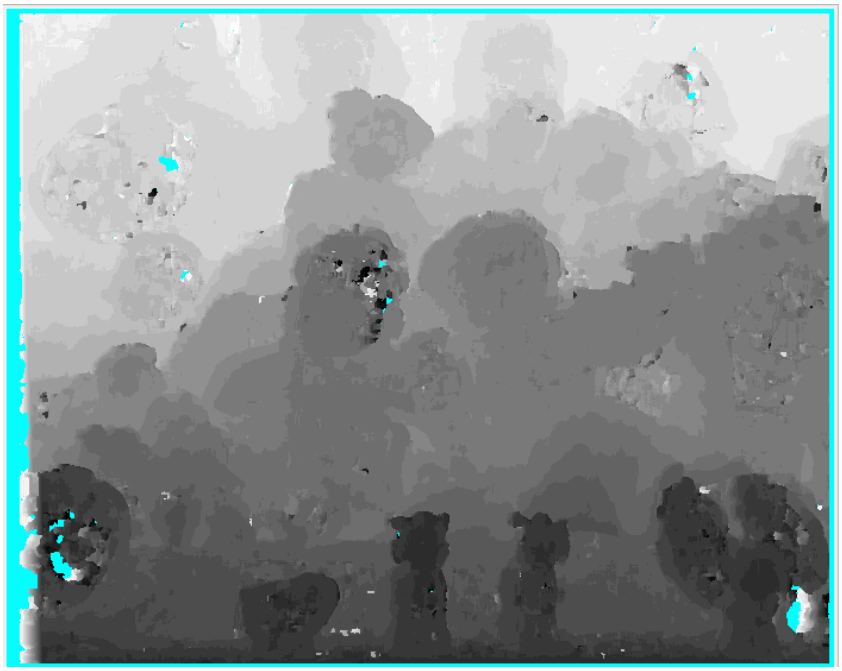


n = 10

Increasing the neighborhood size (which corresponds to changing the data term in the energy) seems to slightly improve the results but on the other hand it also increases the execution time, since the correlation computation directly depends on the patch size.

Comparison with Seeds methods

The first noticeable difference is in the execution time: the graph cuts algorithm is much faster than the Seeds algorithm with a n=3 neighborhood size. Regarding the results, we obtain better and especially smoother and more homogeneous results with Graph Cut.



Results with Seeds algorithm