

VISION

Practical Work n°4: Disparity Map Estimation Using Graph Cuts

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1 Parameters

1.1 Patch size $2 \times n + 1$

The more we increase the patch size, the more it becomes computationally expensive, the more the overlap between patches is big, the more the 3D disparity map tends to be smooth and the more the noise is removed.

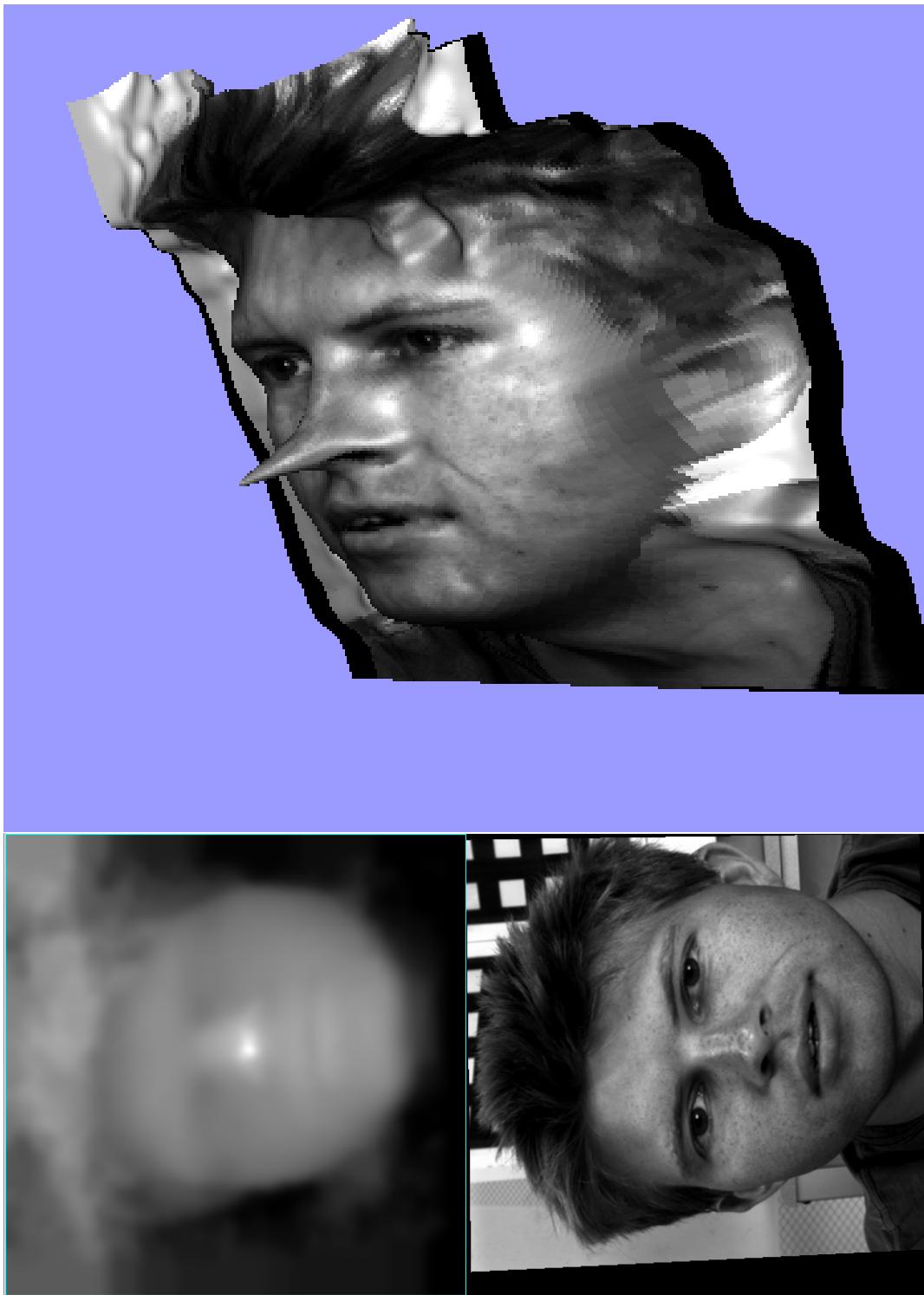


Figure (1) $n = 1$. All the other parameters are unchanged.



Figure (2) $n = 5$. All the other parameters are unchanged.

1.2 Regularization term λ

The more it's costly to cut an edge, the more the number of cut edges is small and therefore the more the 3D disparity map tends to be smooth.



Figure (3) $n = 10$. All the other parameters are unchanged.

1.3 Standard deviation σ of the gaussian filter

The more σ is big, the more the gaussian is big and the more the 3D disparity map is smooth.



Figure (4) $\lambda = 0.02$. All the other parameters are unchanged.

2 Comparison with the region-growing method

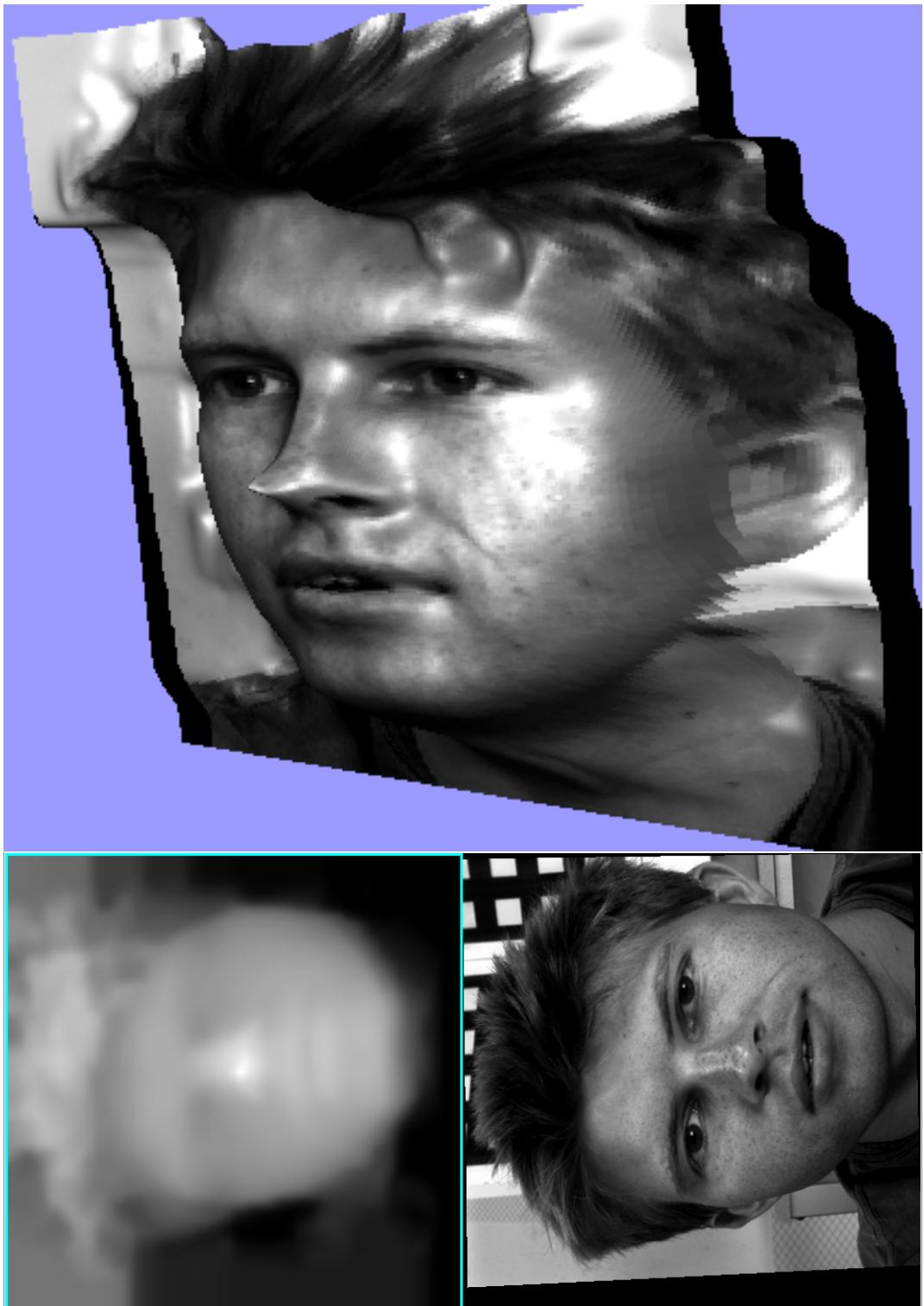


Figure (5) $\lambda = 0.1$. All the other parameters are unchanged.



Figure (6) $\lambda = 0.5$. All the other parameters are unchanged.

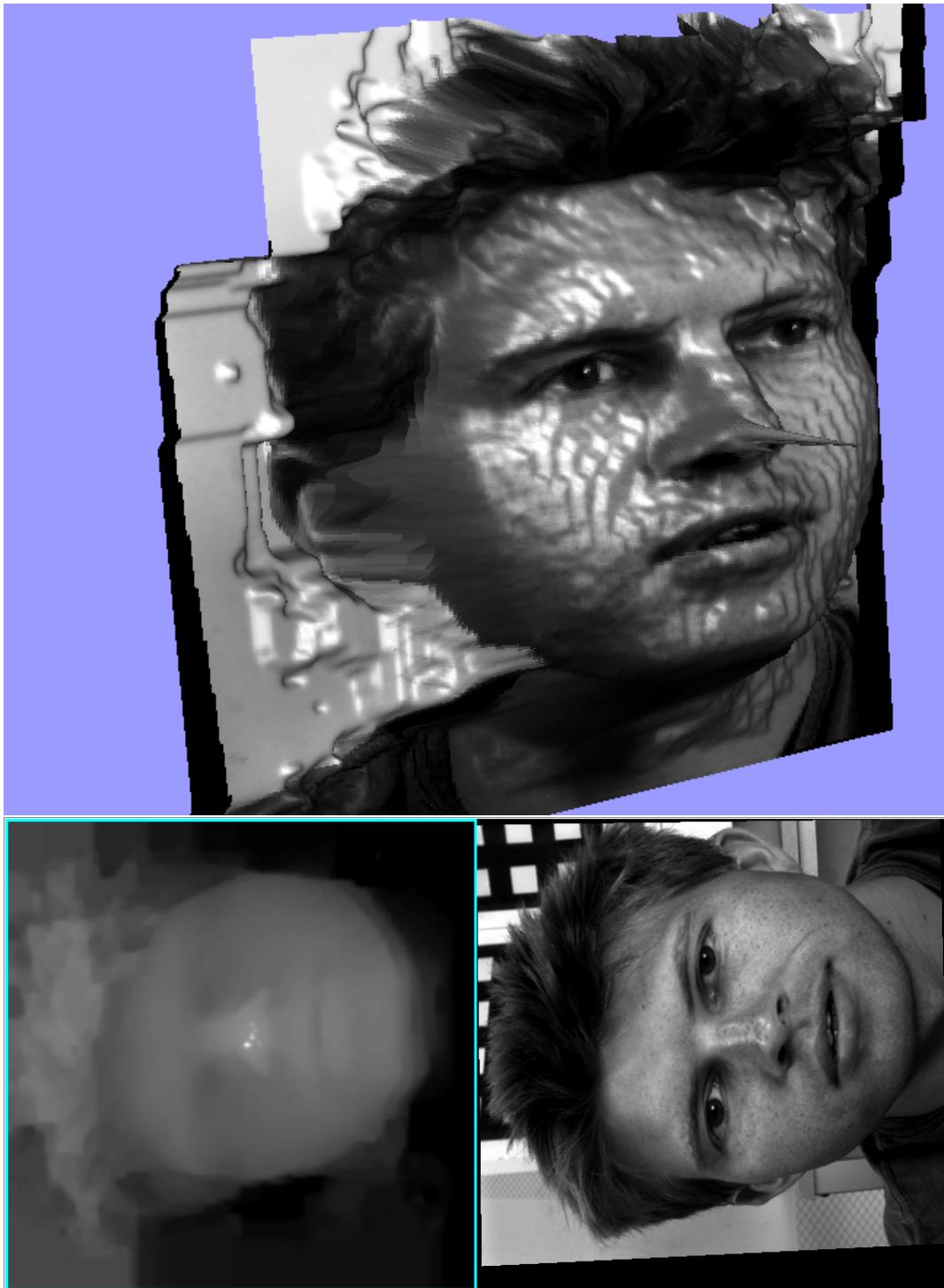


Figure (7) $\sigma = 1$. All the other parameters are unchanged.



Figure (8) $\sigma = 3$. All the other parameters are unchanged.



Figure (9) $\sigma = 6$. All the other parameters are unchanged.



Figure (10) **Results with the region-growing method.** The results are not good because the parameters are not optimized. The computation time was 1 min 27s whereas it took only 23 seconds with the graph-cut method in the same conditions. Graph-cut provides a better result in terms of smoothness. In addition it seems more precise.