Supplementary material

High Resolution Matting via Interactive Trimap Segmentation

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CVPR ‘08

The following slides show further results which are not included in the paper or technical report.

To reduce the size of the document, colour images were slightly compressed. Thus small artefacts may be visible.

Please view the slides in full screen mode.

The following slides show our Ground Truth (GT) Database

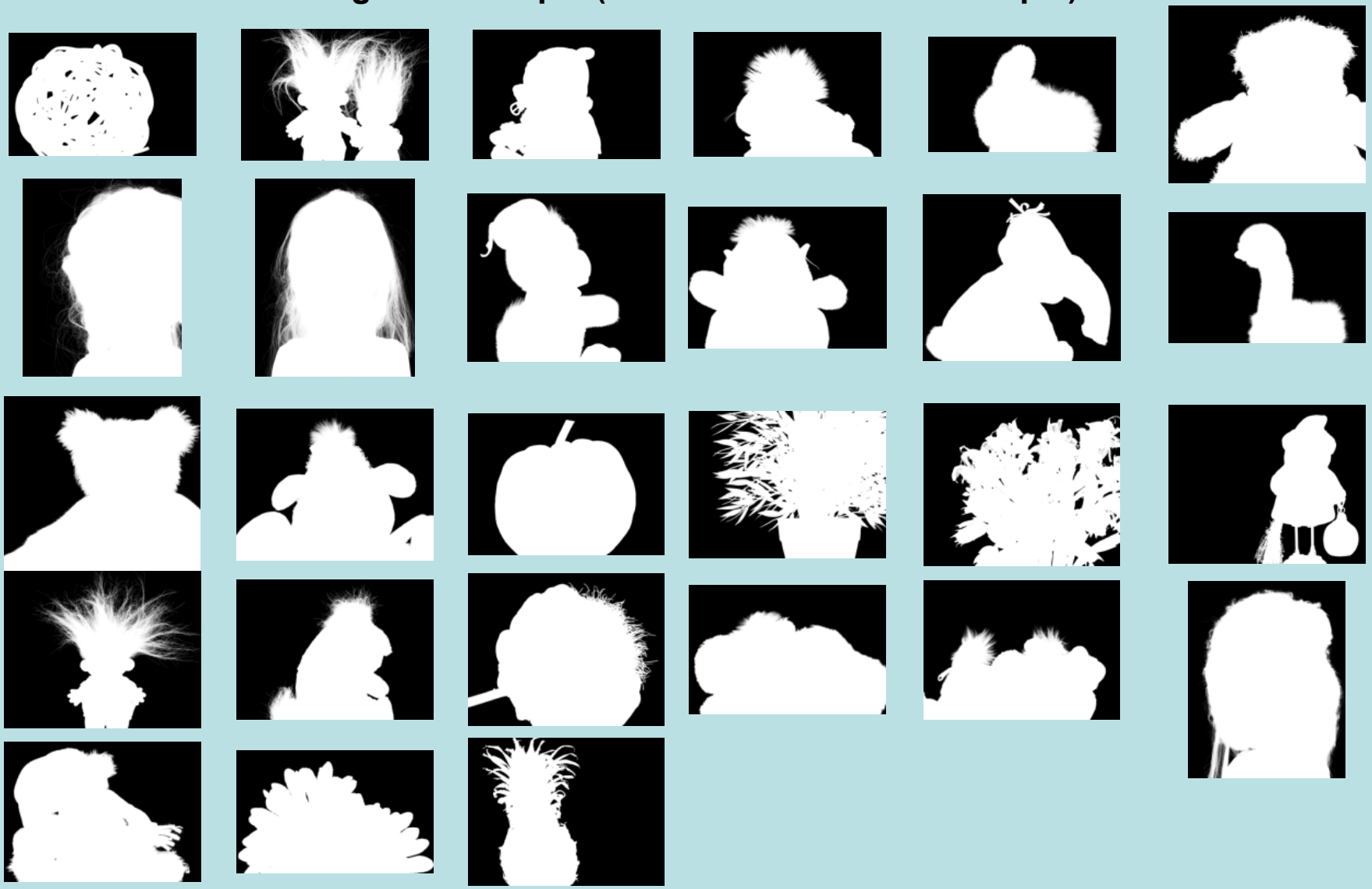
Ground Truth Database Overview

Image size ~7Mpix (here thumbnail size ~0.1Mpix)

Composites from our database.

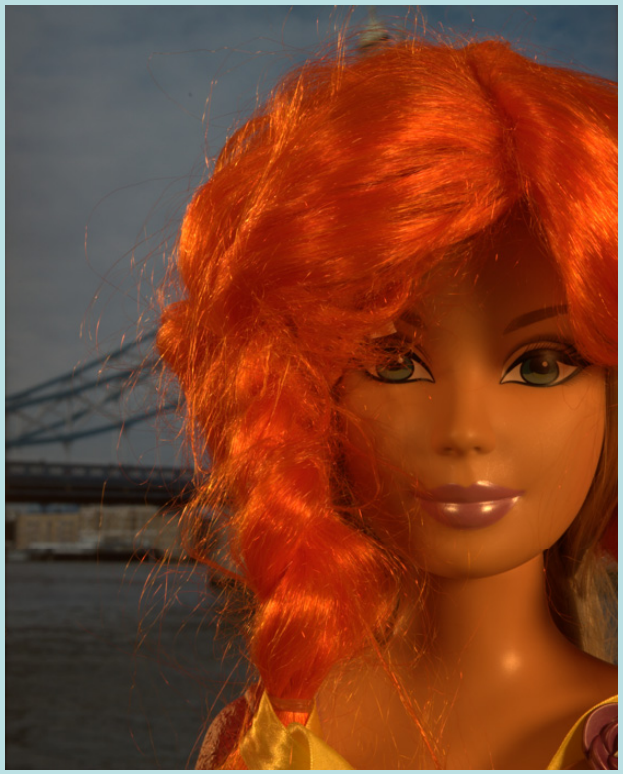
Ground Truth Database Overview

Image size ~7Mpix (here thumbnail size ~0.1Mpix)

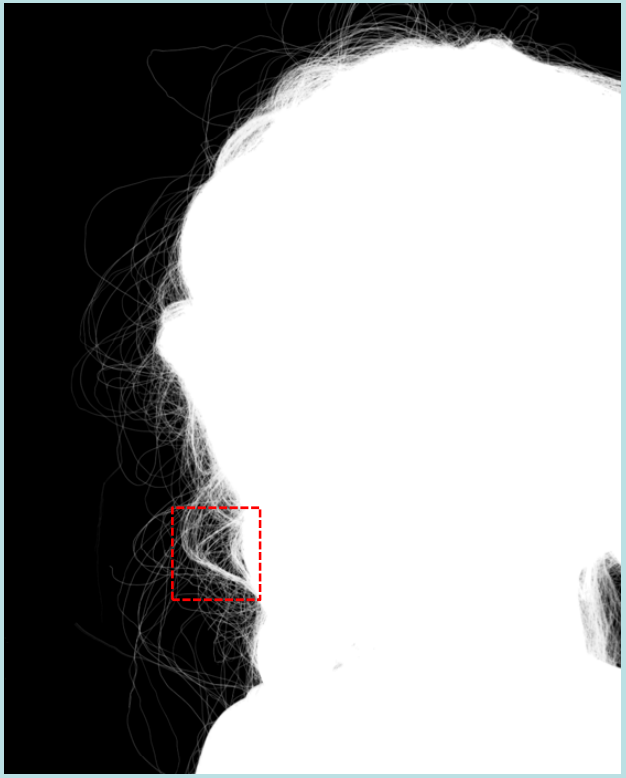


GT alpha from our database.

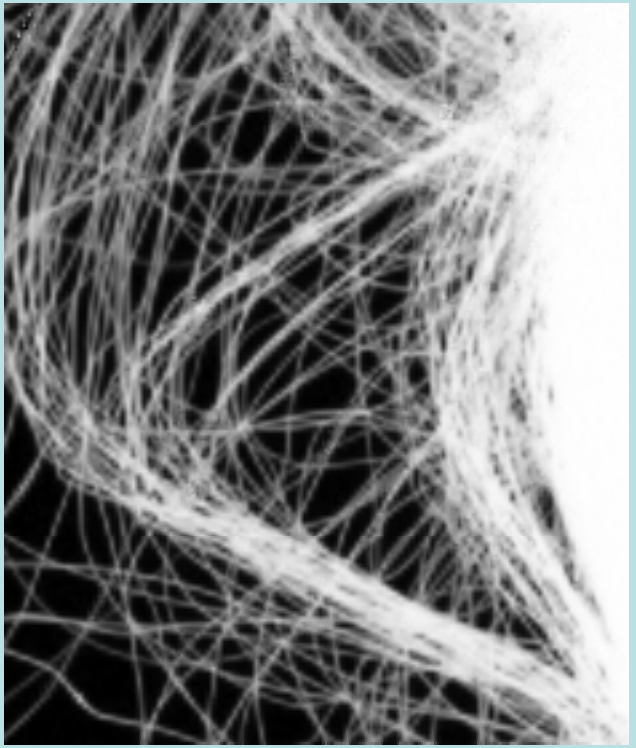
GT Database Close Up (1)



(a) Composite



(b) GT alpha



(c) Zoom-in of marked area in (b) (Full resolution)

GT Database Close Up (2)

(a) Composite

(b) GT alpha

(c) Zoom-in of marked area in (b)

(Full resolution)

Qualitative Comparison

(a) GT alpha of Levin et al. ’07
-- only range $\alpha \in [0.78,1]$

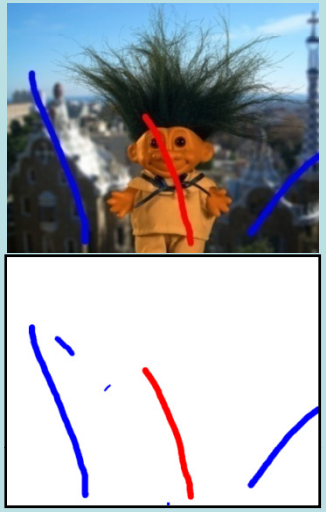
(b) GT alpha of our database
-- only range $\alpha \in [0.78,1]$

This figure compares one example of the GT database of [Levin et al. ’07] with one example of our database. Images (a) and (b) show the composite and *part* of the GT alpha for the two examples. We only show alpha values between 0.78 and 1 which were then scaled to the full range of alpha values, i.e. 0 and 1. Therefore thin hairs with alpha below 0.78 are lost. In (a) a large number of opaque (true foreground) pixels are assigned to an alpha value much lower than 1, whereas (b) shows abetter result.

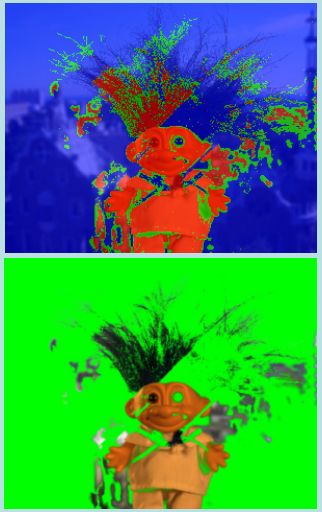
The following slides compare scribble-based matting methods via trimap extraction

Note that many techniques which we compare to, compute an alpha matte directly from scribbles. In our approach, first a trimap is created and then an alpha matte is computed inside this trimap. For methods which directly compute a matte we also visualize a trimap that we generated by thresholding the matte.

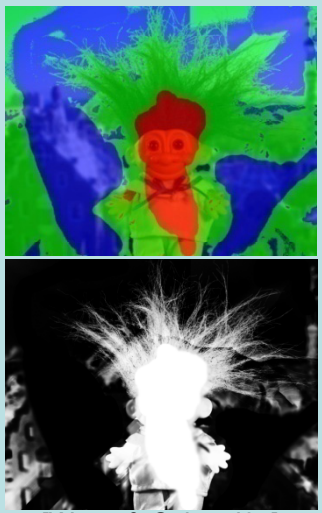
Comparison – extended fig. 6 of the paper



Top: 3 Scribbles
Bottom: 6 Scribbles



[Guan et al. '06]
(23.3;14.0)



[Wang & Cohen '05]
(18.3;9.7)

[Juan & Keriven '06]
(18.0;17.4)

[Levin et al. '07]
(17.6;12.5)

[Wang & Cohen '07]
(14.4;8.2)

[Levin et al. '06]
(13.1;7.4)

Our (pred. λ=3.5)
(5.9;2.0)

Our (opt. λ=3 & 6 scribbles)
(4.9;1.8)

Result from GT Trimap
(0.0;0.93)

GT
(0.0;0.0)

Trimaps and composites generated with different approaches. Results were generated from the scribbles in the top left image, except for bottom row, column 4 where we adjusted λ and used 3 extra scribbles (shown in scribble image top row, bottom left). In brackets is our trimap- and matting error. Note, for [Wang & Cohen '05] the authors provided us only with the alpha matte.

Comparison – extended fig. 2 of the paper

Input for (a,b,c,d)

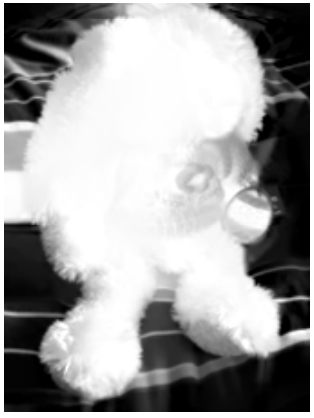
(a) [Guan et al. ‘06]

Input for (e)

Input for (f)

Input for (g)

(b) [Levin et al. ‘07]

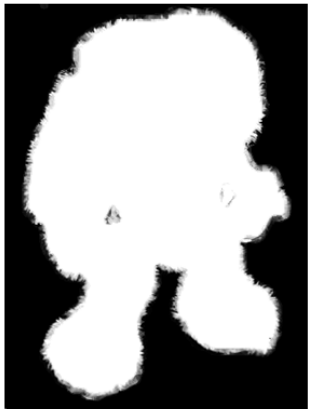


(c) [Wang & Cohen ‘05]

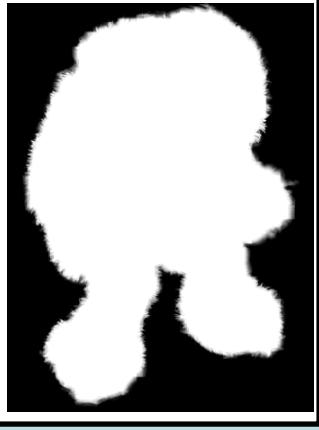
(d) [Wang & Cohen ‘07]

(e) [Levin et al. ‘06]

(f) [Wang & Cohen ‘05]

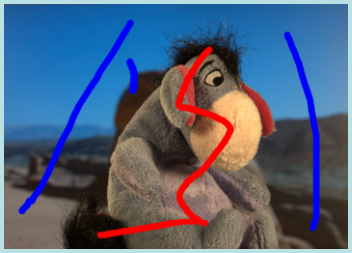


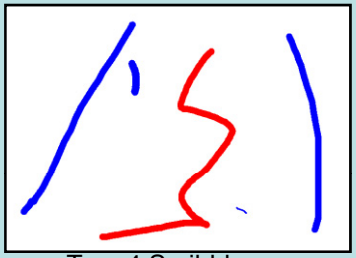
(g) Our approach



Our result was achieved with a single bounding box selection, inspired by GrabCut [15], and one additional background brush stroke. Note, our approach can also handle more challenging alpha mattes, e.g. fig. 1 of the paper. All results we show were either taken from the original papers or created with the original implementation of the respective authors.

Comparison (2)





Top: 4 Scribbles
Bottom: 5 Scribbles

[Levin et al. ’07]
(13.4;6.4)

[Juan & Keriven ’06]
(11.8;8.3)

[Guan et al. ’06]
(10.6;8.6)

[Levin et al. ’06]
(6.1;3.5)

[Wang & Cohen ’07]
(5.5;6.4)

Our (pred. λ=2.2)
(1.9;1.0)

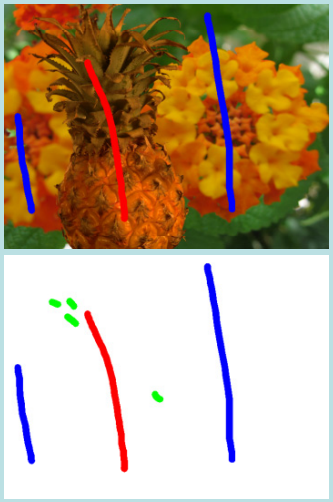
Our (opt. λ=1.8 & 5 scribbles)
(1.8;0.7)

Result from GT Trimap
(0.0;0.5)

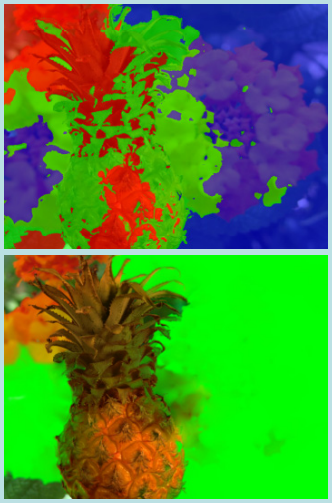
GT
(0.0;0.0)

Trimaps and composites generated with different approaches. Results were generated from the scribbles in the top left image, except for bottom row, column 3 where we adjusted λ and used 1 extra scribble (shown in scribble image top row, bottom left) . In brackets is our trimap- and matting error. Note, the color of the object in the GT composite is slightly different due to varying gamma corrections.

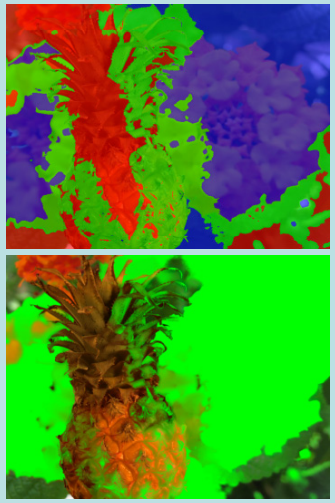
Comparison (3)



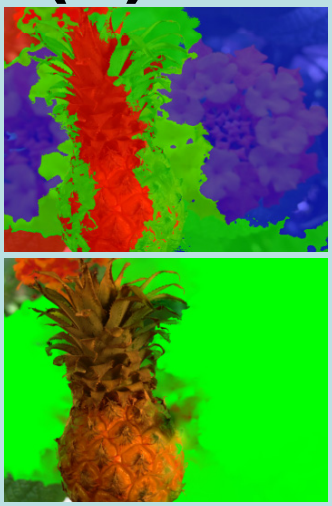
Top: 3 Scribbles
Bottom: 7 Scribbles



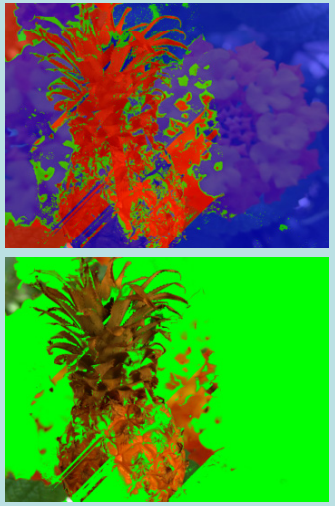
[Levin et al. ’07]
(30.4;21.6)



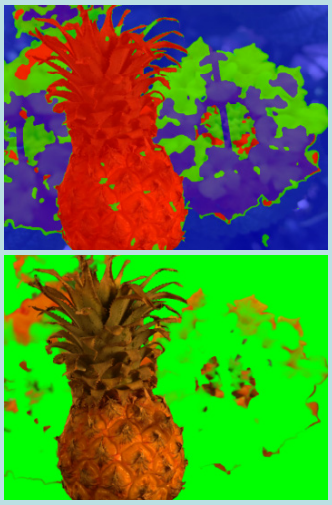
[Wang & Cohen ’07]
(26.3;28.5)



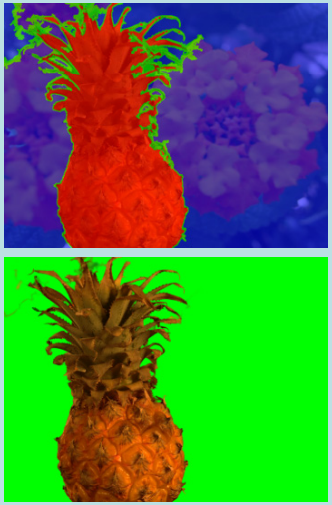
[Levin et al. ’06]
(20.3;15.1)



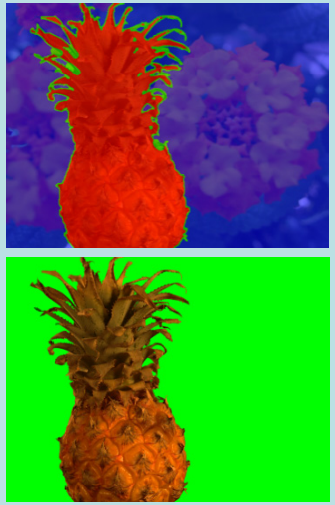
[Guan et al. ’06]
(18.0;16.7)



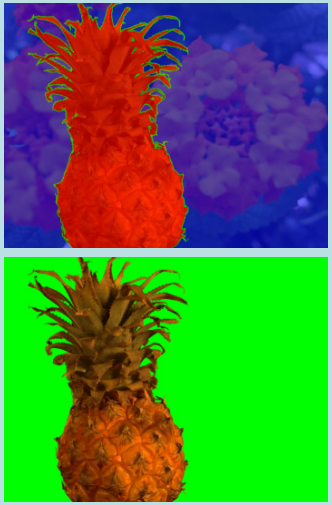
[Juan & Keriven ’06]
(13.4;13.6)



Our (pred. λ=1.3)
(2.1;1.0)



Our (opt. λ=0.6 & 7 scribbles)
(1.2;0.6)



Result from GT Trimap
(0.0;0.3)

GT
(0.0;0.0)

Trimaps and composites generated with different approaches. Results were generated from the scribbles in the top left image, except for bottom row, column 3 where we adjusted λ and used 4 extra scribbles (shown in scribble image top row, bottom left) . In brackets is our trimap- and matting error.

Comparison (4)

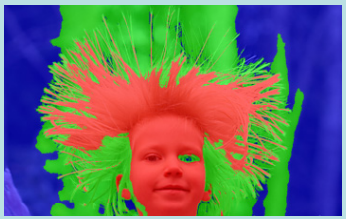
example kindly provided by Jue Wang (see [Wang et al. ’07])

Top: 3 Scribbles
Bottom: 5 Scribbles

[Levin et al. ’07]
(25.2;33.3)

[Levin et al. ’06]
(17.8;12.0)

[Guan et al. ’06]
(17.4;15.9)



[Wang & Cohen ’07]
(14.5;14.8)

[Juan & Keriven ’06]
(13.5;18.8)

Our (pred. λ=4.5)
(10.1;2.8)

Our (opt. λ=5.8 & 5 scribbles)
(9.4;2.5)

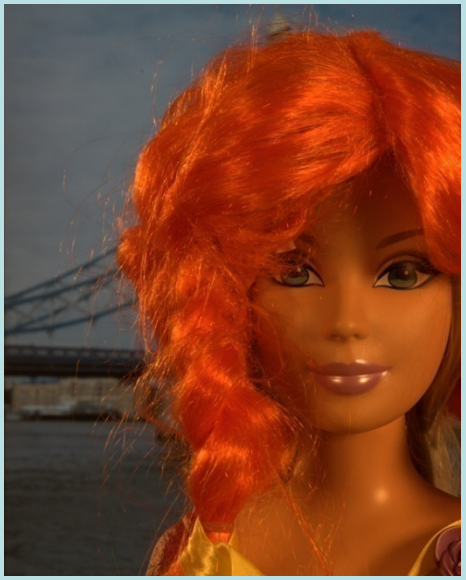
Result from GT Trimap
(0.0;2.1)

GT
(0.0;0.0)

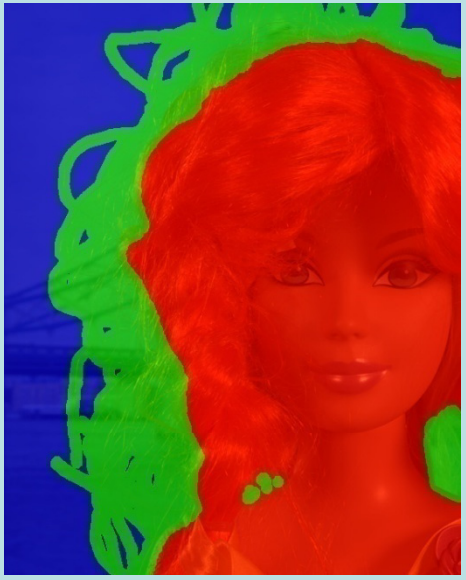
Trimaps and composites generated with different approaches. Results were generated from the scribbles in the top left image, except for bottom row, column 3 where we adjusted λ and used 2 extra scribbles (shown in scribble image top row, bottom left) . In brackets is our trimap- and matting error.

The following slides compare trimap-based matting methods

Comparison (1) – Small trimap



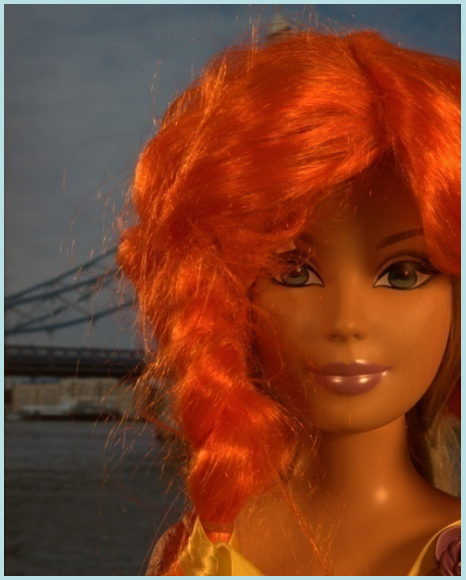
Input image



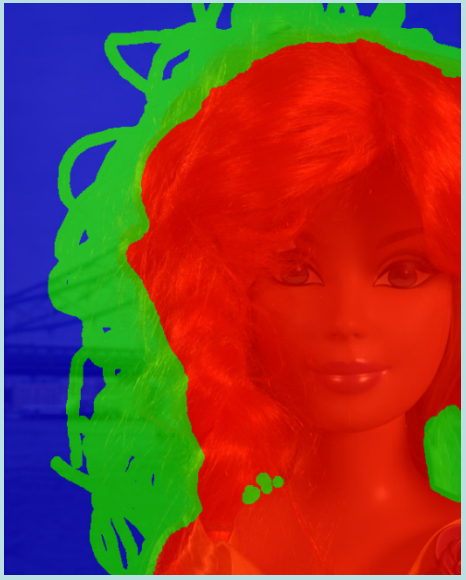
Input image superimposed with trimap

Result for [Levin et al. ’06]

Comparison (1) – Small trimap



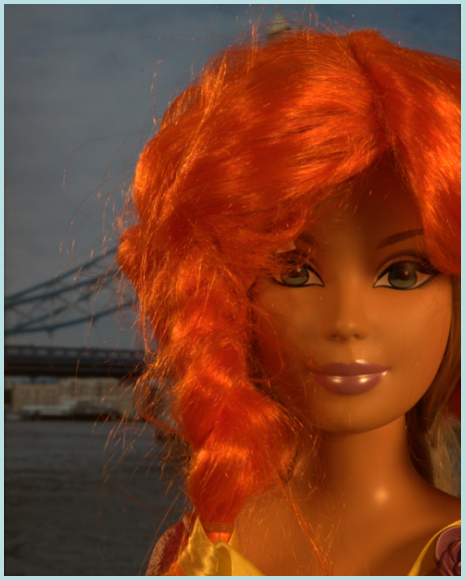
Input image



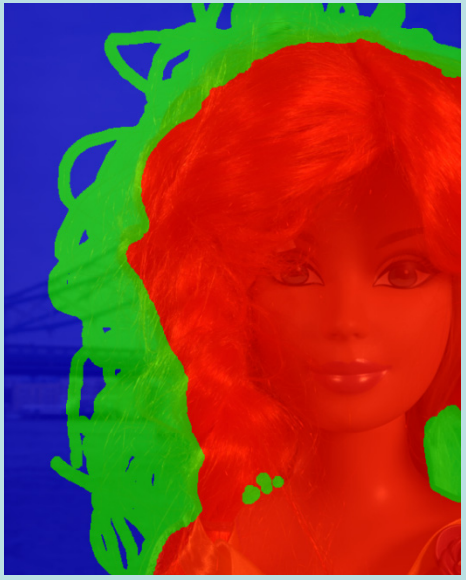
Input image superimposed with trimap

Result for our method without sparsity prior
(similar to [Wang et al. ’07])

Comparison (1) – Small trimap



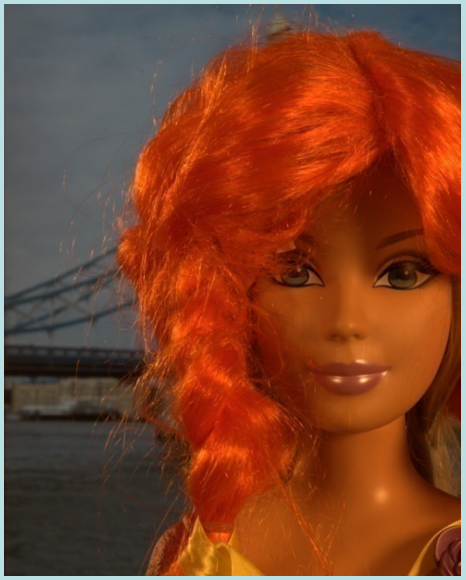
Input image



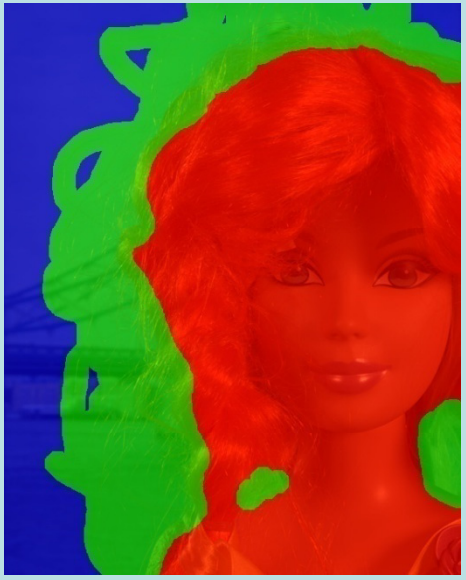
Input image superimposed with trimap

Result for our method with sparsity prior
(Note that blurry artifacts are removed)

Comparison (1) – Large trimap



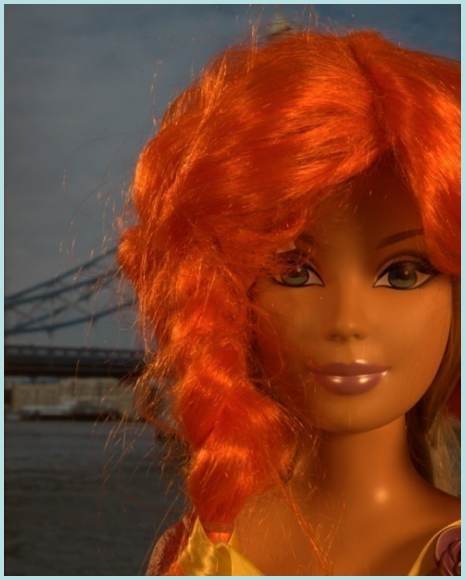
Input image



Input image superimposed with trimap

Result for [Levin et al. ’06]

Comparison (1) – Large trimap

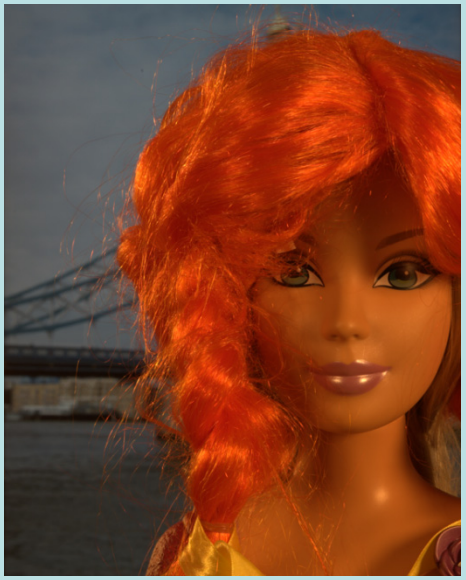


Input image

Input image superimposed with trimap

Result for our method without sparsity prior
(similar to [Wang et al. ’07])

Comparison (1) – Large trimap



Input image

Input image superimposed with trimap

Result for our method with sparsity prior
(Note that blurry artifacts are removed)

Comparison (2)

Input image

Input image superimposed with trimap

Result for [Levin et al. ’06]

Comparison (2)

Input image

Input image superimposed with trimap

Result for our method without sparsity prior
(similar to [Wang et al. ’07])

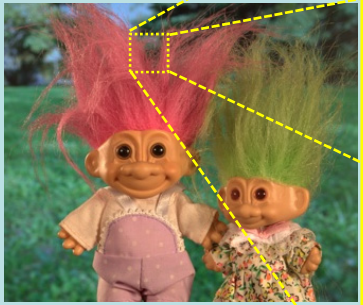
Comparison (2)

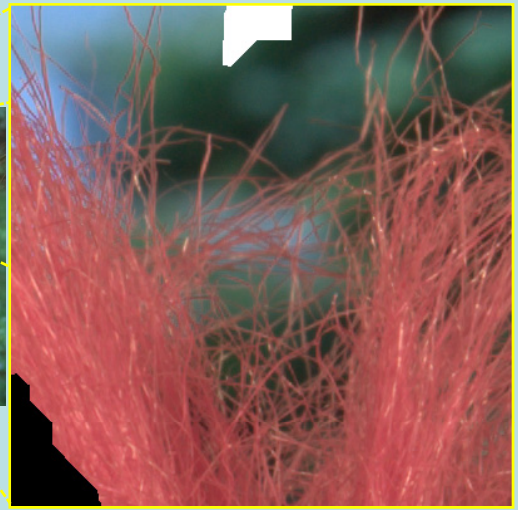
Input image

Input image superimposed with trimap

Result for our method with sparsity prior
(Note that blurry artifacts are removed)

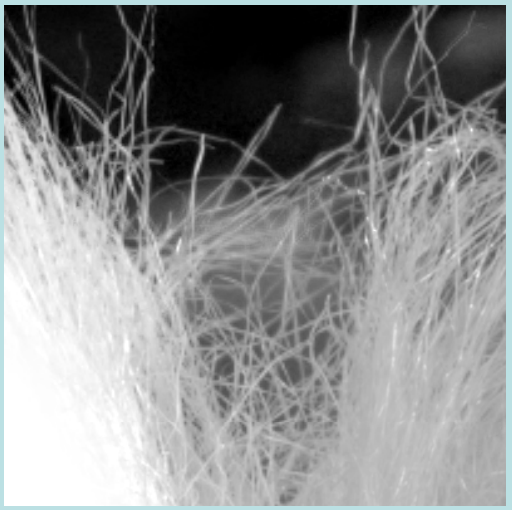
Close Up (1) - fig. 5 of the paper



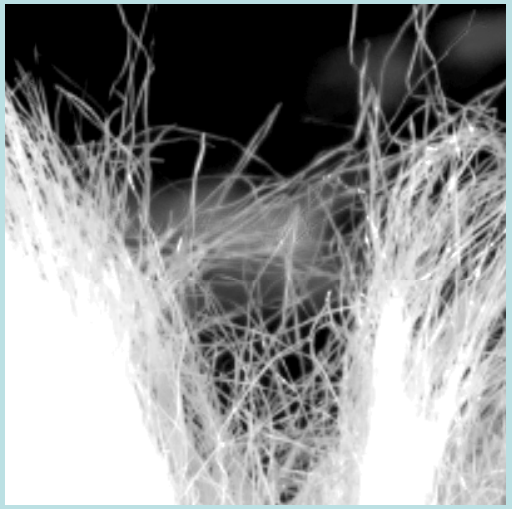


Input image superimposed with trimap

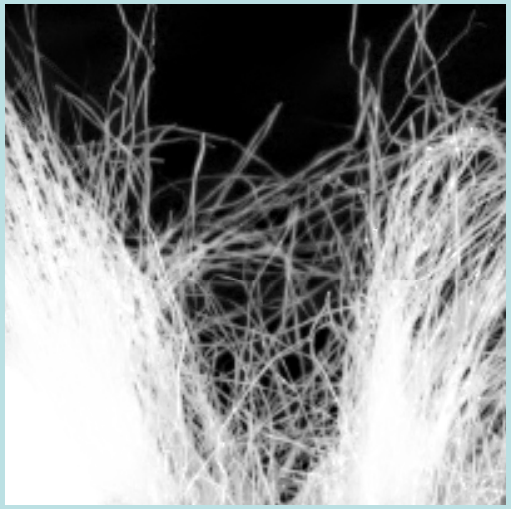
[Levin et al. ’07]



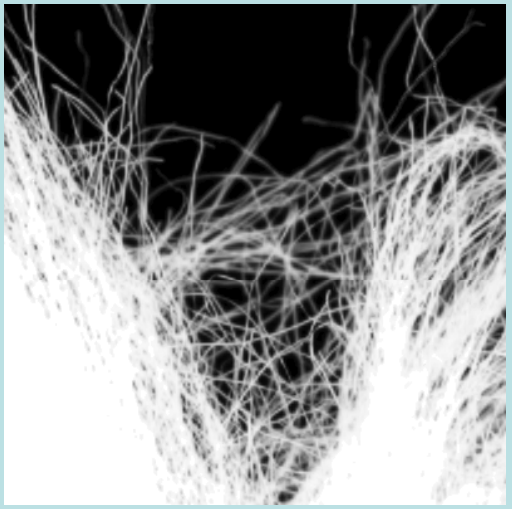
[Levin et al. ’06]



[Wang et al. ’07]



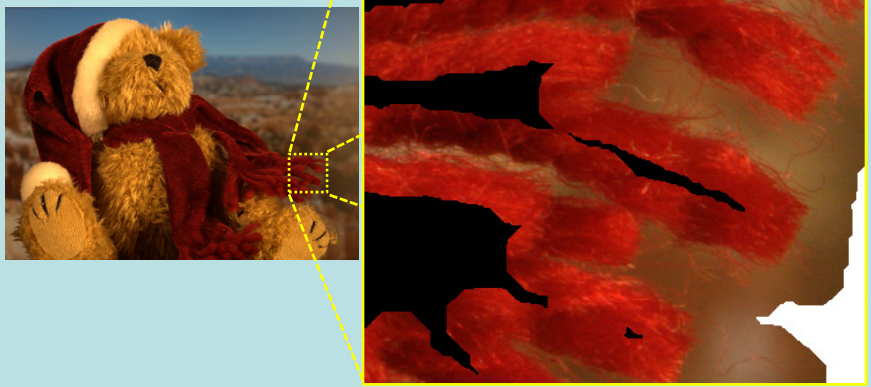
Our method with sparsity prior



Ground truth alpha

The top left image shows a crop of a 7.6 Mpixel image of a region with a lot of hair. The input image is superimposed with the trimap (black fgd., white bkg.). The remaining images show results generated with various methods. Note that the images were scaled down by a factor of 2.

Close Up (1) - fig. 7 of the paper

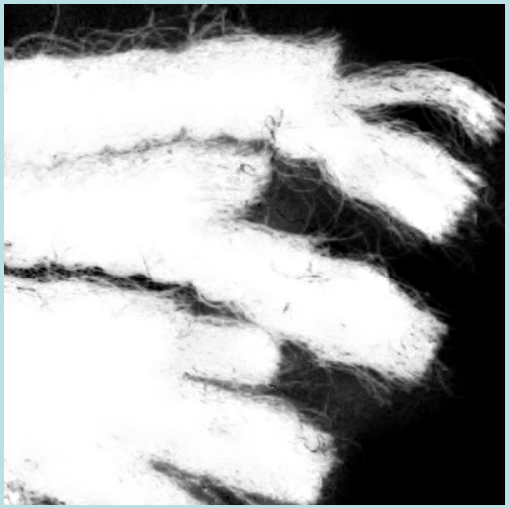


Input image superimposed with trimap

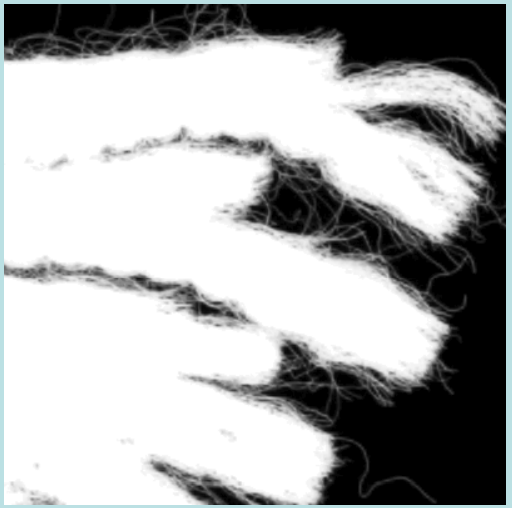
[Levin et al. ’07]

[Levin et al. ’06]

[Wang et al. ’07]



Our method with sparsity prior



Ground truth alpha

The top left image shows a crop of a 7.7 Mpixel image of a furry region (part of a woollen scarf). The input image is superimposed with the trimap (black fgd., white bkg.). The remaining images show results generated with various methods.
Note that the images were scaled down by a factor of 2.