Blind motion deblurring using image statistics

Supplementary Material

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Example 1-input

Example 1- deblurring the entire image

12 tap kernel

Example 1- result

Example 1-recomparing to input

Example 1- local evidence

Vertical edges map and the maximum likelihood model in each pixel

White: $lk_{\text{unblurred}}(i) > lk_{\text{12 pixels blur}}(i)$

Gray: $lk_{\text{unblurred}}(i) < lk_{\text{12 pixels blur}}(i)$

Example 1- inferred segmentation

Example 2-input

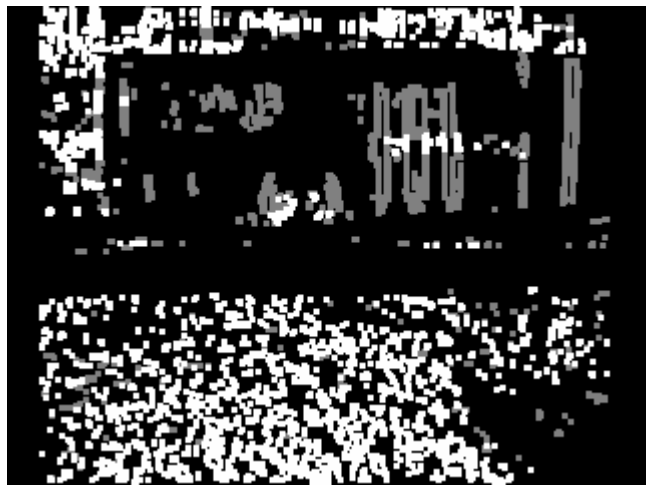
Example 2- deblurring the entire image

4 tap kernel

Example 2- result

Example 2- recomparing to input

Example 2- local evidence



Vertical edges map and the maximum likelihood model in each pixel

White: $lk_{\text{unblurred}}(i) > lk_{\text{4 pixels blur}}(i)$

Gray: $lk_{\text{unblurred}}(i) < lk_{\text{4 pixels blur}}(i)$

Example 2- inferred segmentation

Example 2 with wrong histograms - input

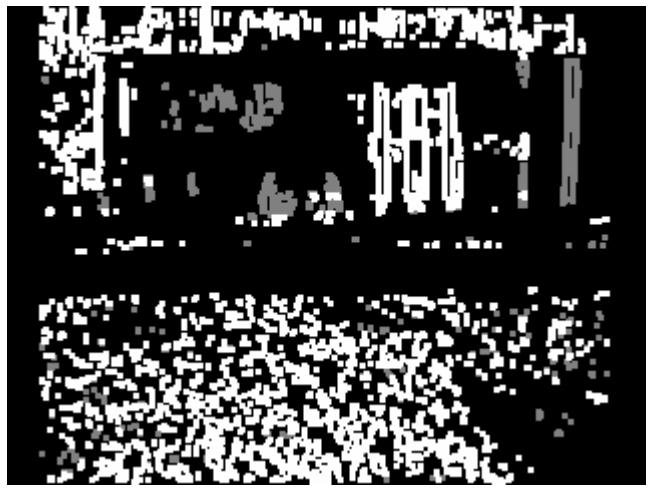
Example 2 with wrong histograms – deblurring the entire image

6 tap kernel

Example 2 with wrong histograms – result

Example 2 with wrong histograms – recomparing to input

Example 2 with wrong histograms – local evidence

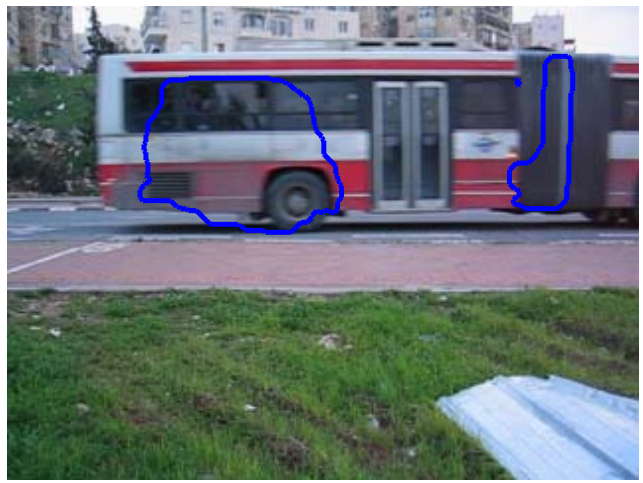


Vertical edges map and the maximum likelihood model in each pixel

White: $lk_{unblurred}(i) > lk_{6\ pixels\ blur}(i)$

Gray: $lk_{unblurred}(i) < lk_{6\ pixels\ blur}(i)$

Example 2 with wrong histograms - inferred segmentation



Example 3- input

In orig size

zoomed

Example 3- deblurring the entire image

6 tap kernel

In orig size

zoomed

Example 3- result

In orig size

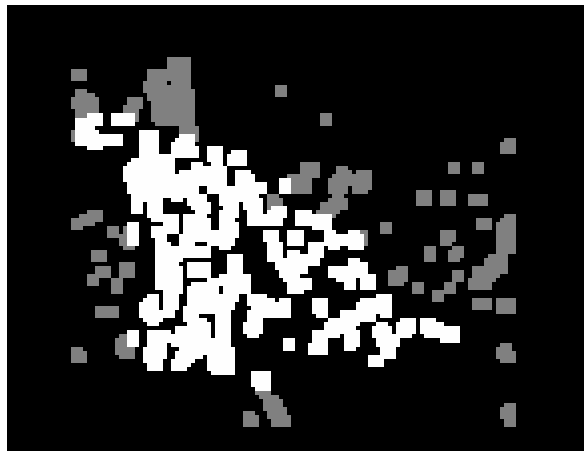
zoomed

Example 3- recomparing to input

In orig size

zoomed

Example 3- local evidence

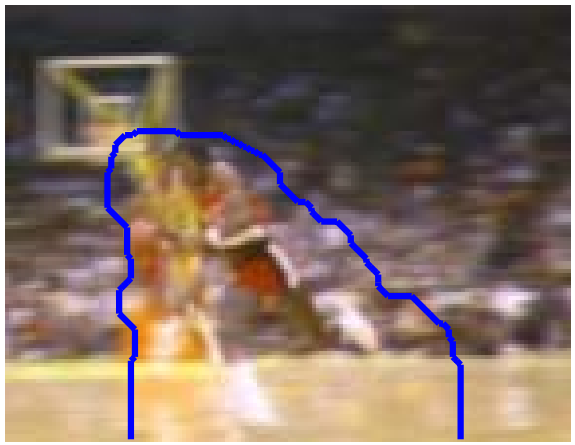


Vertical edges map and the maximum likelihood model in each pixel

White: $lk_{\text{unblurred}}(i) > lk_{\text{6 pixels blur}}(i)$

Gray: $lk_{\text{unblurred}}(i) < lk_{\text{6 pixels blur}}(i)$

Example 3- inferred segmentation



Example 4 (extracting 3 layers) - input

Example 4 (extracting 3 layers) - deblurring the entire image

1st kernel- 2 tap

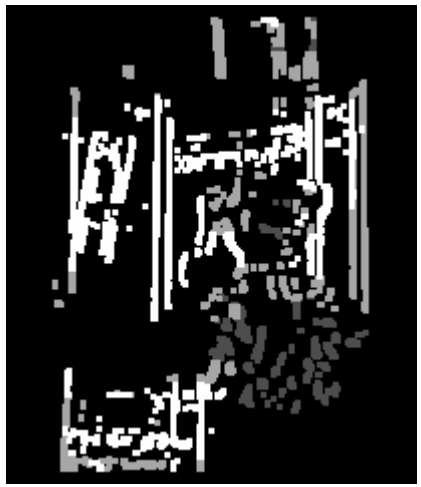
Example 4 (extracting 3 layers) - deblurring the entire image

2nd kernel- 9 tap

Example 4 (extracting 3 layers)- result

Example 4 (extracting 3 layers) - recomparing to input

Example 4 (extracting 3 layers) - local evidence



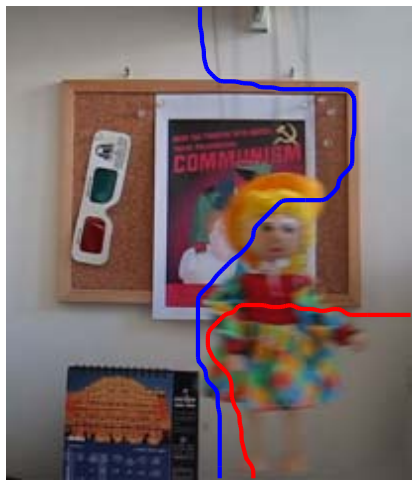
Vertical edges map and the maximum likelihood model in each pixel

White: unblurred

Light Gray: 2 pixels blur

Dark gray: 9 pixels blur

Example 4 (extracting 3 layers) - inferred segmentation



Example 5 (extracting 3 layers) - input

In orig size

zoomed

Example 5 (extracting 3 layers) - deblurring the entire image

1nd kernel- 4 tap

In orig size

zoomed

Example 5 (extracting 3 layers) - deblurring the entire image

2nd kernel- 8 tap

In orig size

zoomed

Example 5 (extracting 3 layers)- result

In orig size

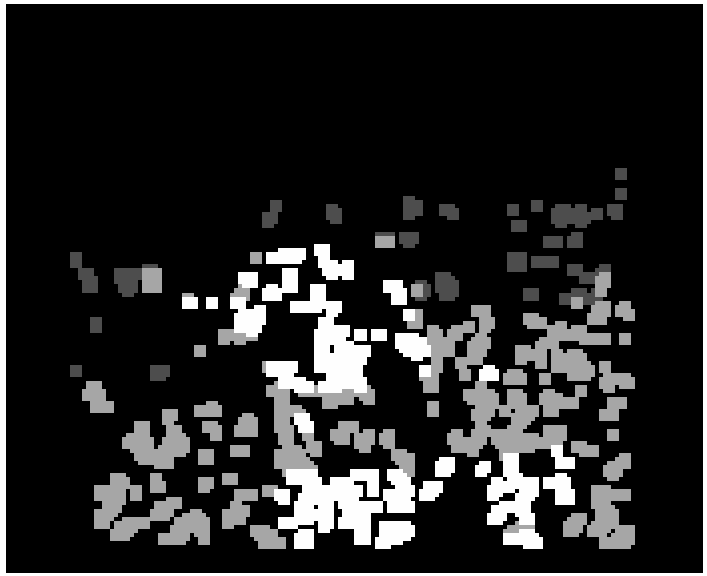
zoomed

Example 5 (extracting 3 layers) - recomparing to input

In orig size

zoomed

Example 5 (extracting 3 layers) - local evidence



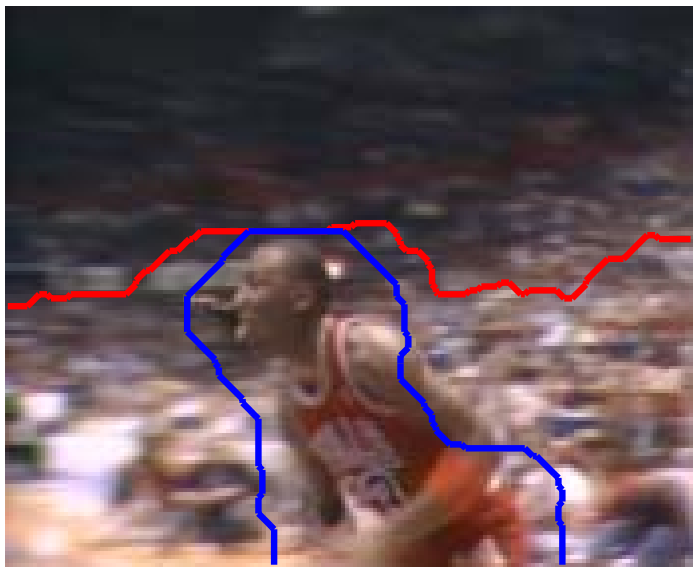
Vertical edges map and the maximum likelihood model in each pixel

White: unblurred

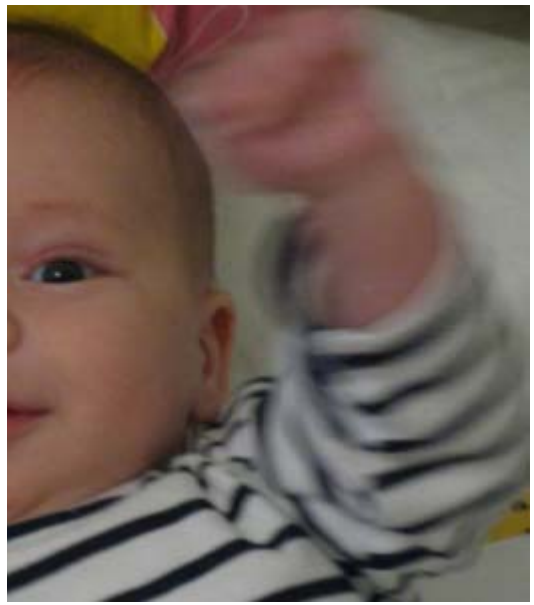
Light Gray: 4 pixels blur

Dark gray: 8 pixels blur

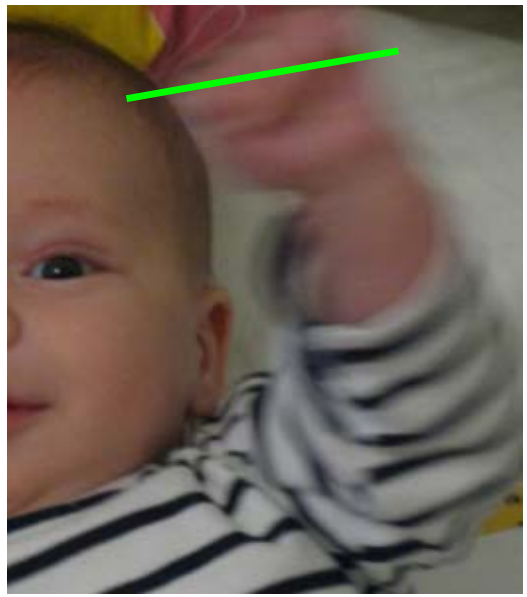
Example 5 (extracting 3 layers) - inferred segmentation



Example 6 (non horizontal blur)- input



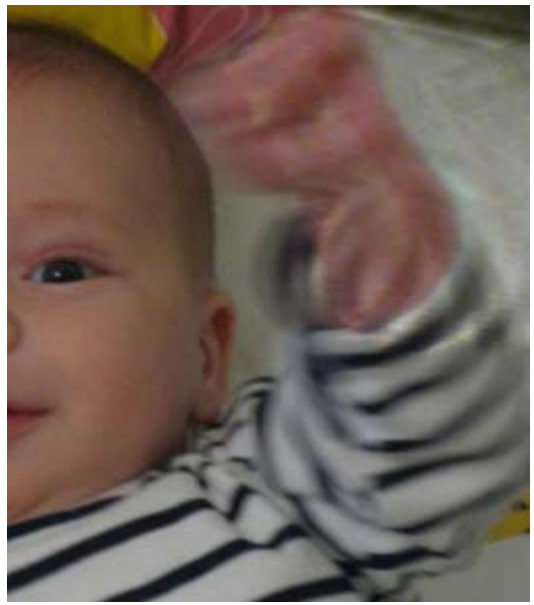
Example 6 (non horizontal blur)- estimated blur direction



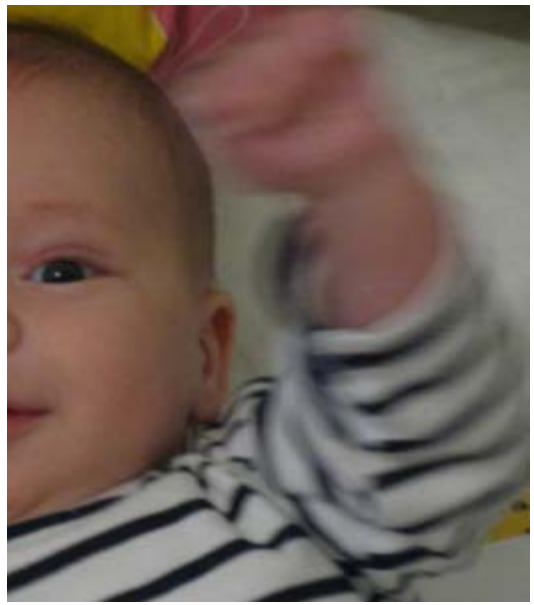
Example 6 (non horizontal blur)- deblurring the entire image

26 tap kernel

Example 6 (non horizontal blur)- result



Example 6 (non horizontal blur)- recomparing to input



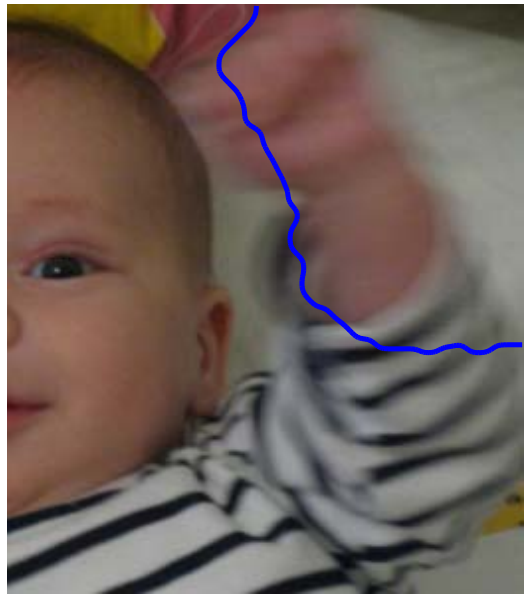
Example 6 (non horizontal blur)- local evidence

Edges map and the maximum likelihood model in each pixel

White: $lk_{\text{unblurred}}(i) > lk_{\text{26 pixels blur}}(i)$

Gray: $lk_{\text{unblurred}}(i) < lk_{\text{26 pixels blur}}(i)$

Example 6 (non horizontal blur) - inferred segmentation



Example 7 (non horizontal blur)- input

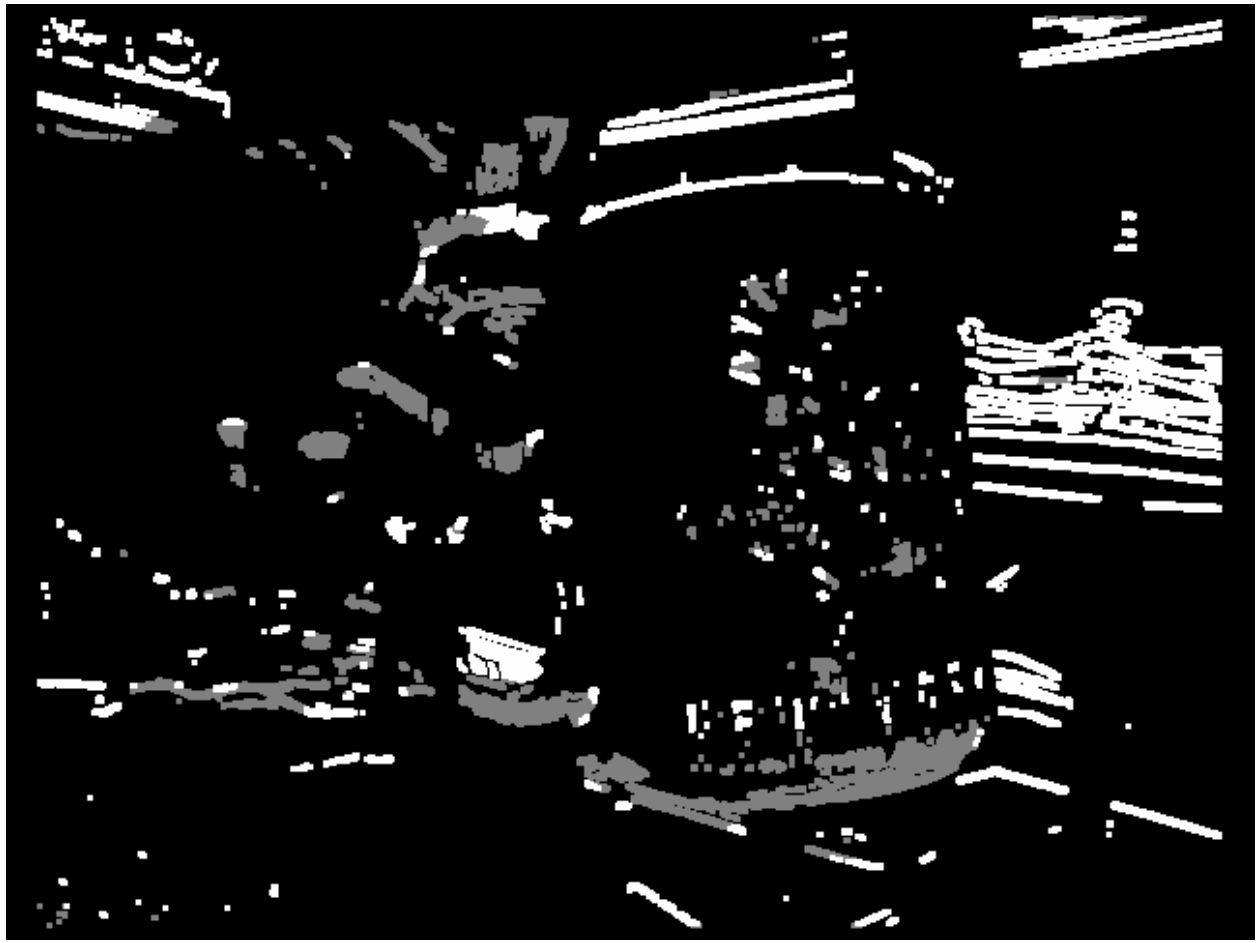
Example 7 (non horizontal blur)-estimated blur direction

Example 7 (non horizontal blur)-deblurring the entire image

Example 7 (non horizontal blur)- result

Example 7 (non horizontal blur)-recomparing to input

Example 7 (non horizontal blur)- local evidence



Edges map and the maximum likelihood model in each pixel

White: $lk_{\text{unblurred}}(i) > lk_{\text{15 pixels blur}}(i)$

Gray: $lk_{\text{unblurred}}(i) < lk_{\text{15 pixels blur}}(i)$

Example 7 (non horizontal blur)- inferred segmentation

Failure example - input

Failure example - deblurring the entire image

6 tap kernel

Failure example - result

Failure example – recomparing to input

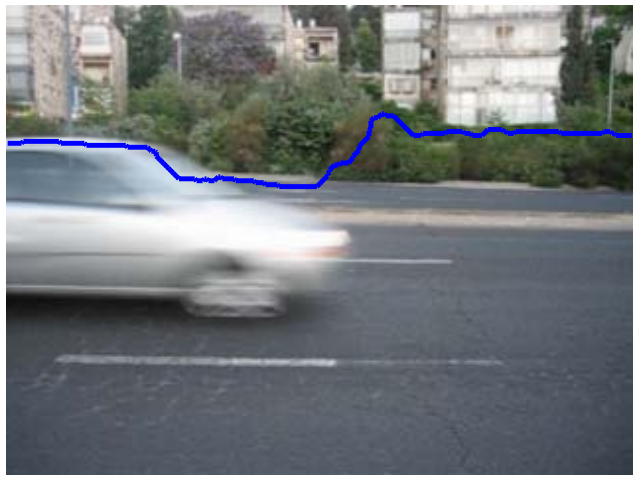
Failure example - local evidence

Edges map and the maximum likelihood model in each pixel

White: $lk_{unblurred}(i) > lk_{6\ pixels\ blur}(i)$

Gray: $lk_{unblurred}(i) < lk_{6\ pixels\ blur}(i)$

Failure example - inferred segmentation



Comparison- using unsupervised segmentation

input

Comparison- using unsupervised segmentation

segments + sizes of fitted blur model

Comparison- using unsupervised segmentation result

Comparison- using unsupervised segmentation recomparing to input

Comparison- using unsupervised segmentation recomparing to our result