Supplementary material:

Direction-aware Spatial Context Features for Shadow Detection

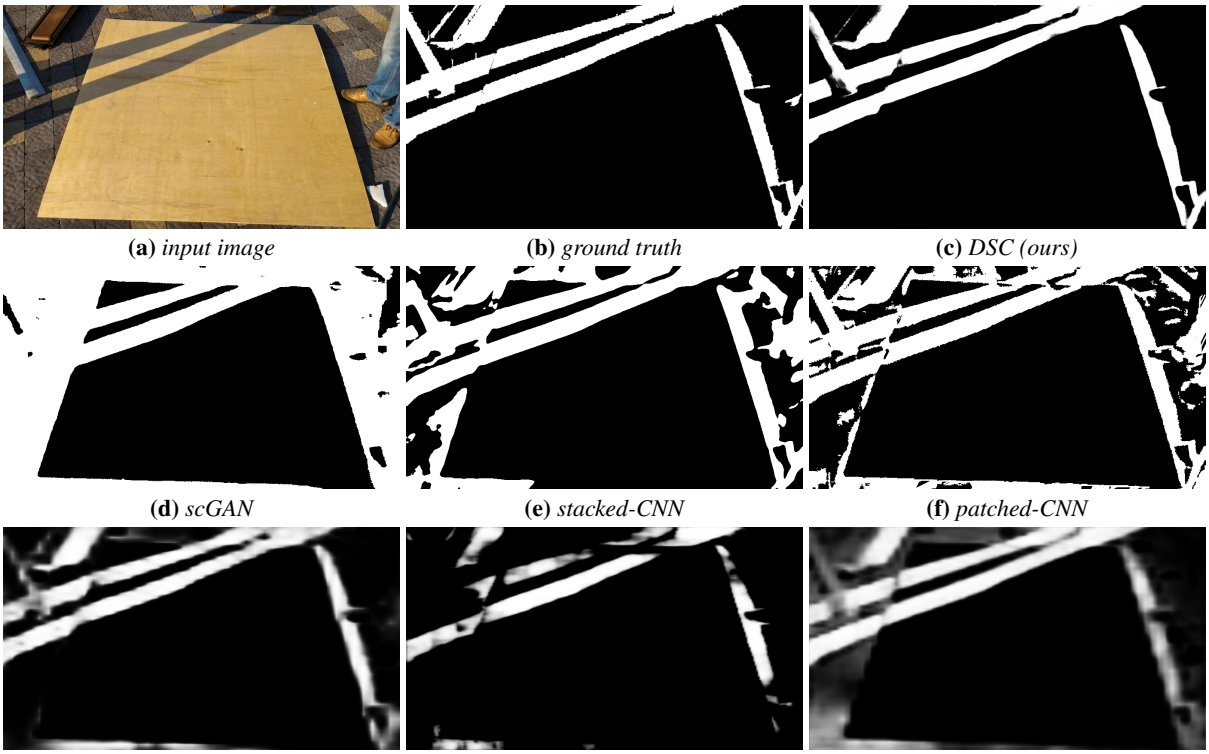
There are two parts in this supplementary material.

The first part (part 1) presents additional comparison results against the following works:

- ***scGAN:*** V. Nguyen, T. F. Y. Vicente, M. Zhao, M. Hoai, and D. Samaras. Shadow detection with conditional generative adversarial networks. In *ICCV*, pages 4510–4518, 2017.
- ***stacked-CNN:*** T. F. Y. Vicente, L. Hou, C.-P. Yu, M. Hoai, and D. Samaras. Large-scale training of shadow detectors with noisily-annotated shadow examples. In *ECCV*, pages 816–832, 2016.
- ***patched-CNN:*** S. Hosseinzadeh, M. Shakeri, and H. Zhang. Fast shadow detection from a single image using a patched convolutional neural network. *arXiv preprint arXiv:1709.09283*, 2017.
- ***SRM:*** T. Wang, A. Borji, L. Zhang, P. Zhang, and H. Lu. A stage-wise refinement model for detecting salient objects in images. In *ICCV*, pages 4019–4028, 2017.
- ***Amulet:*** P. Zhang, D. Wang, H. Lu, H. Wang, and X. Ruan. Amulet: Aggregating multi-level convolutional features for salient object detection. In *ICCV*, pages 202–211, 2017.
- ***PSPNet:*** H. Zhao, J. Shi, X. Qi, X. Wang, and J. Jia. Pyramid scene parsing network. In *CVPR*, pages 2881–2890, 2017.

The second part (part 2) presents more results produced from our method.

Part 1. Additional Comparison Results

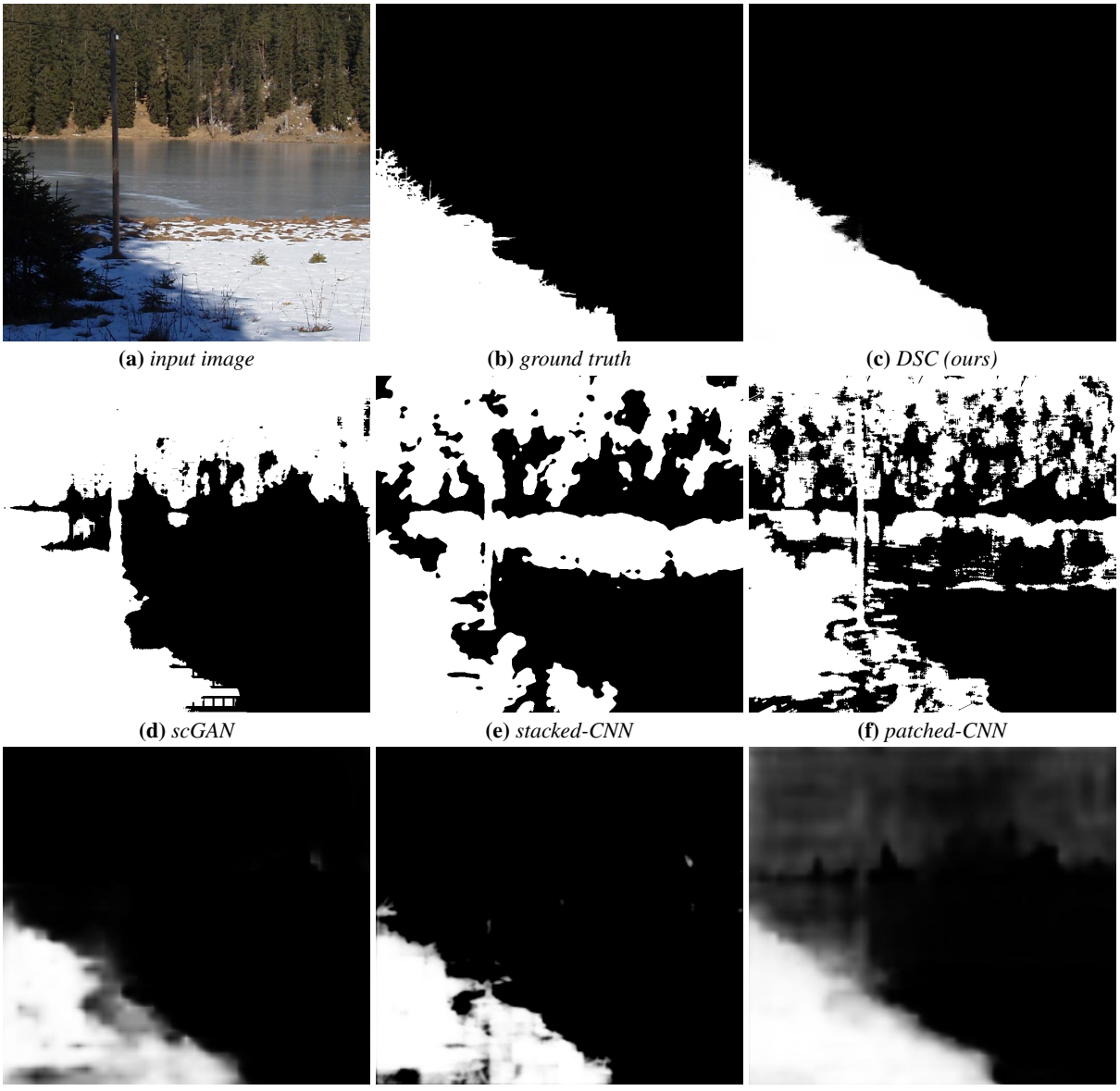


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 1: *More visual comparison results #1 (white indicates shadows and black indicates non-shadows).*

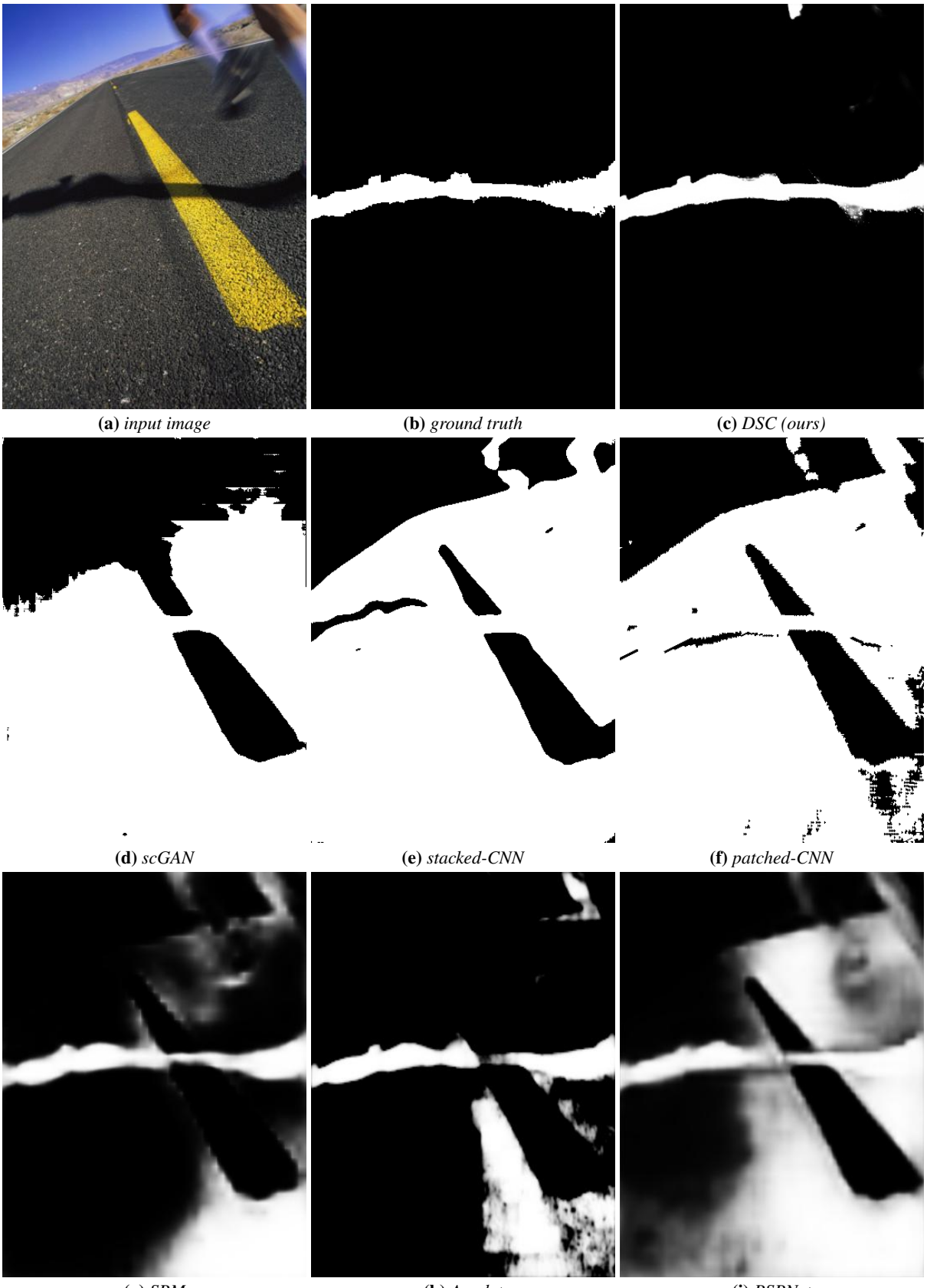


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 2: *More visual comparison results #2 (white indicates shadows and black indicates non-shadows).*

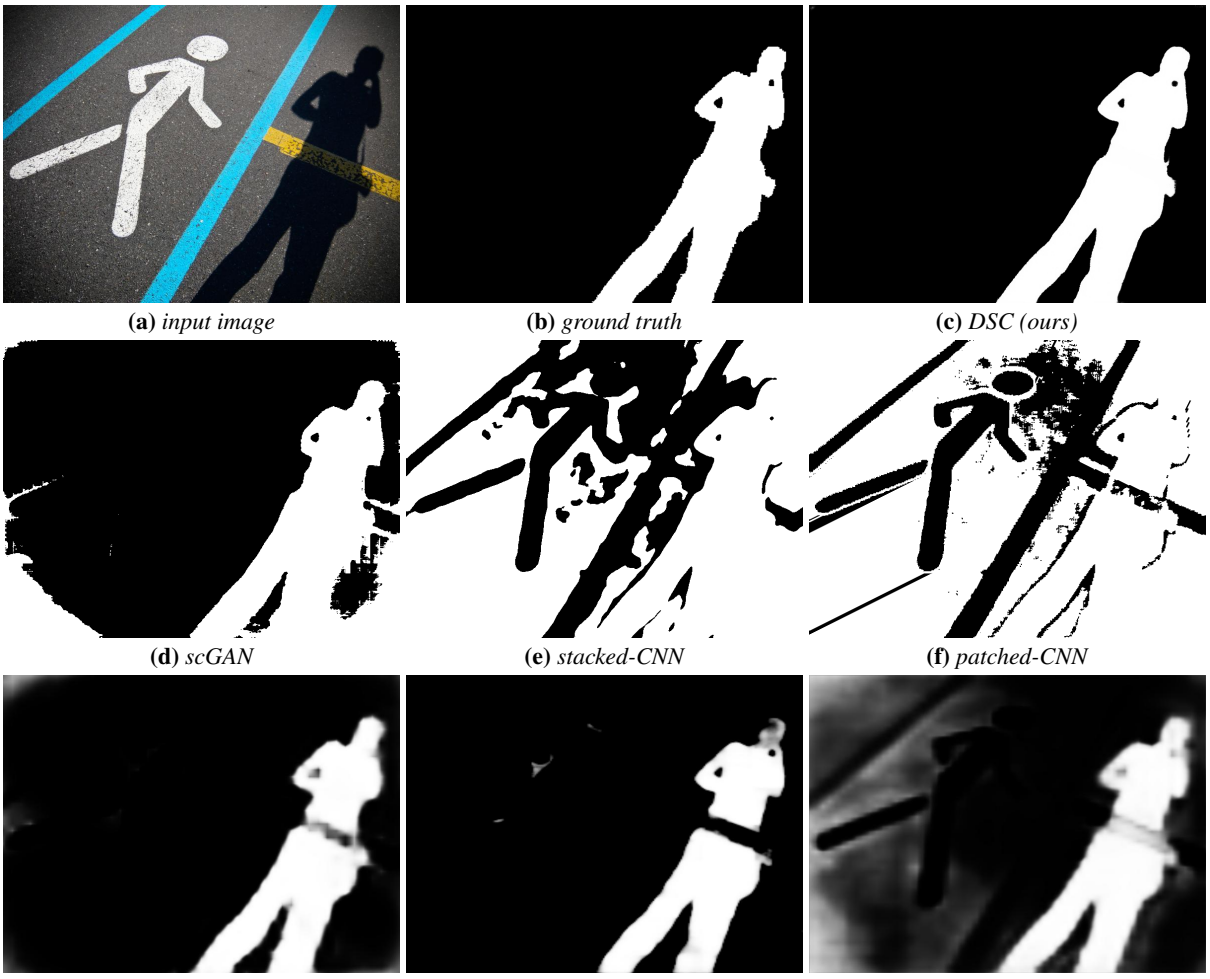


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 3: *More visual comparison results #3 (white indicates shadows and black indicates non-shadows).*

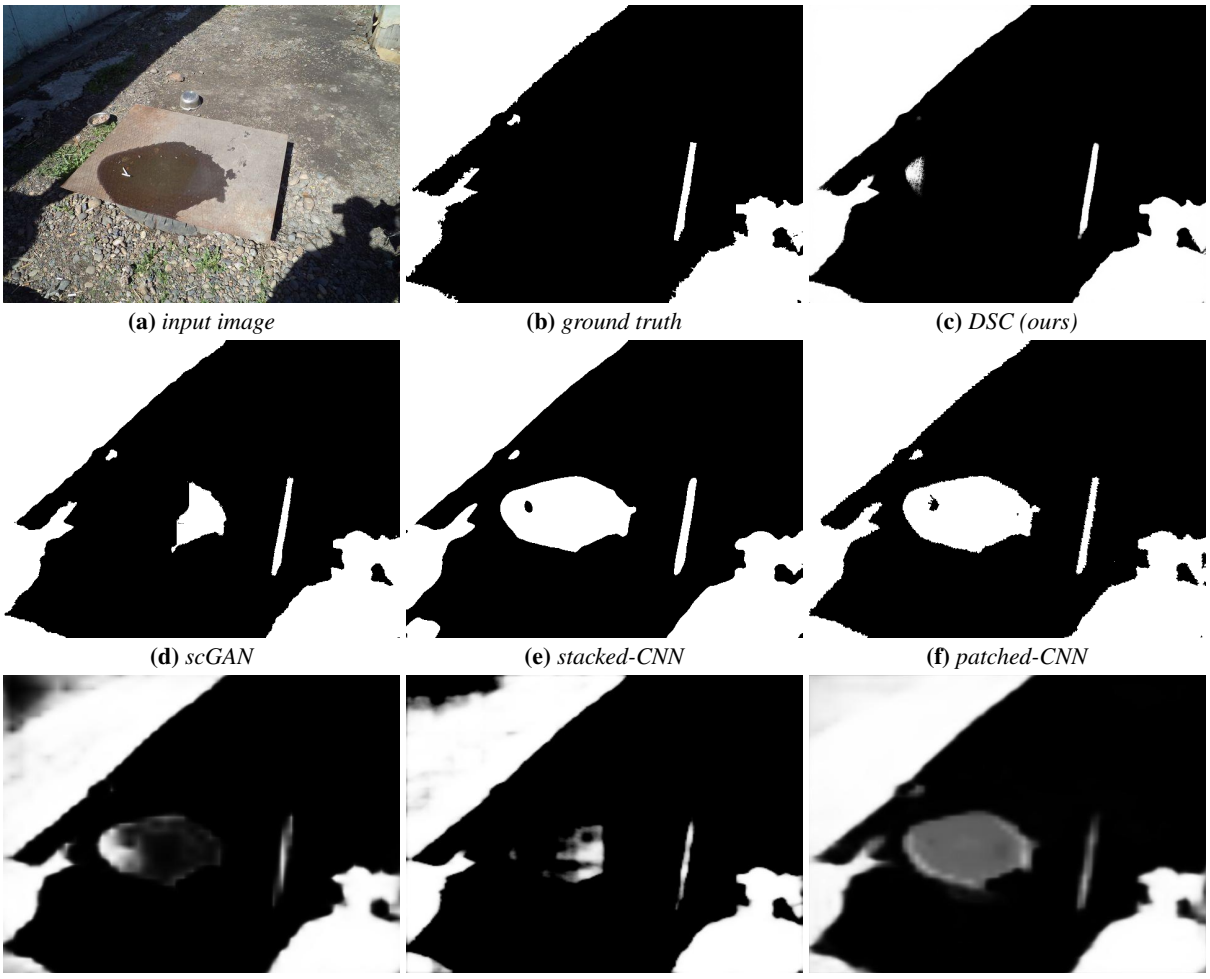


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 4: *More visual comparison results #4 (white indicates shadows and black indicates non-shadows).*

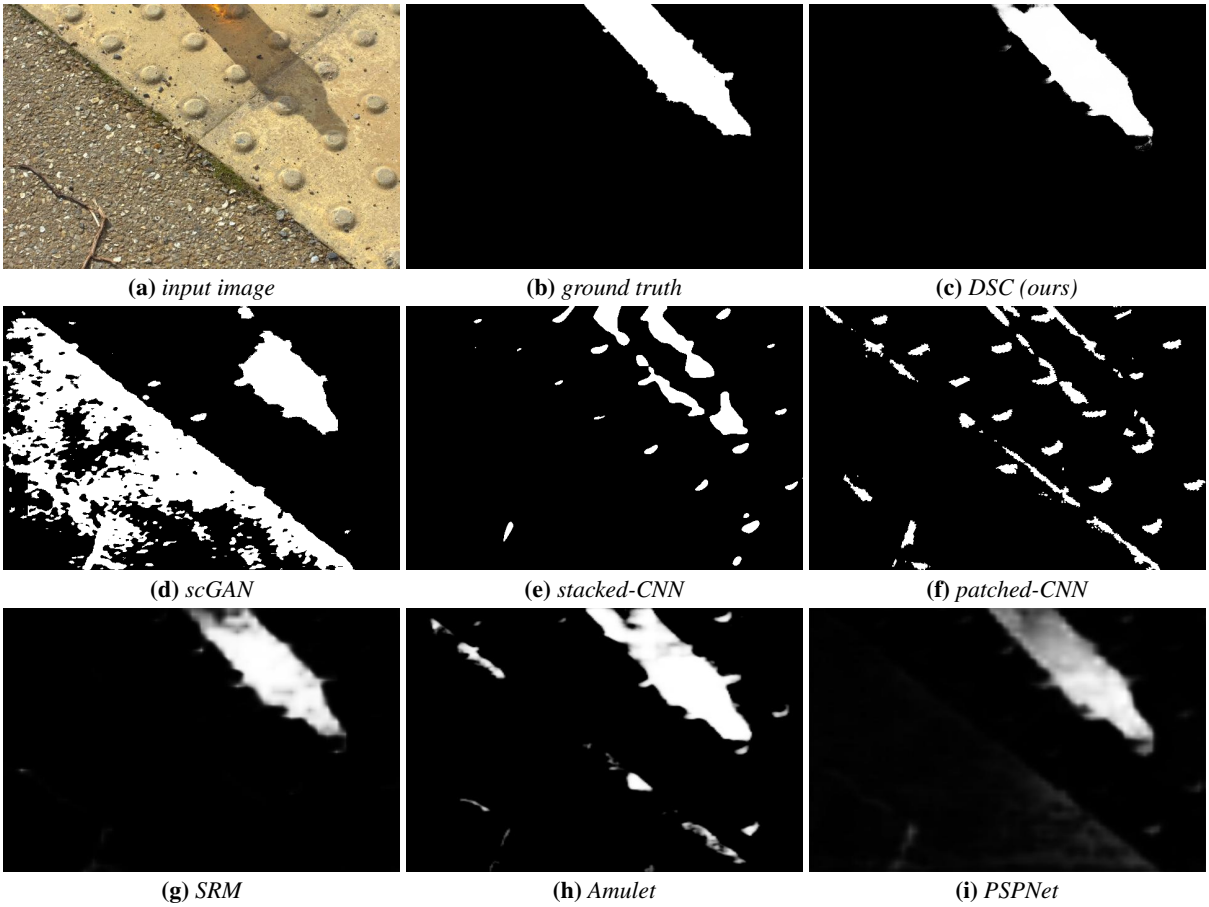


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 5: *More visual comparison results #5 (white indicates shadows and black indicates non-shadows).*

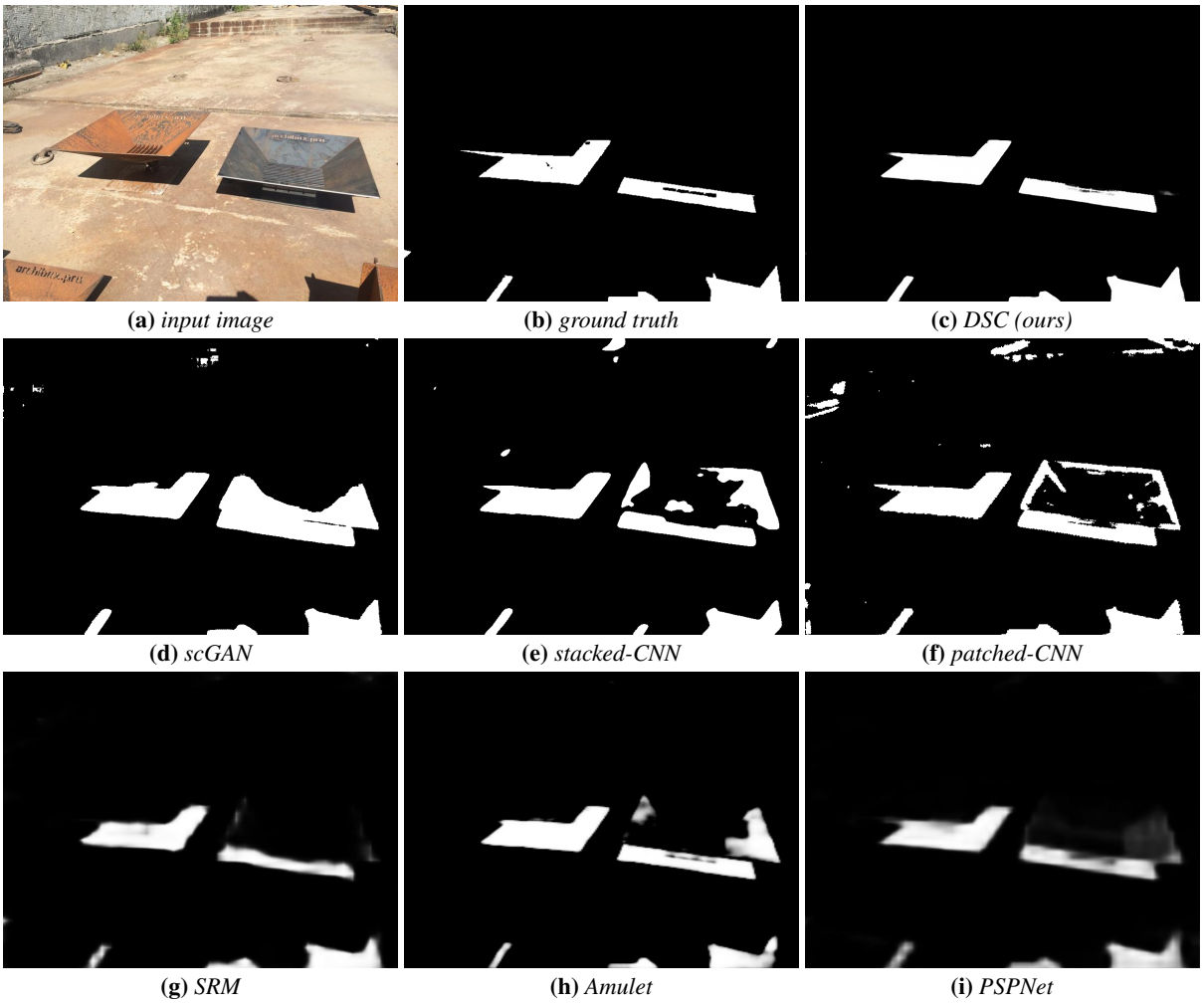


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 6: *More visual comparison results #6 (white indicates shadows and black indicates non-shadows).*

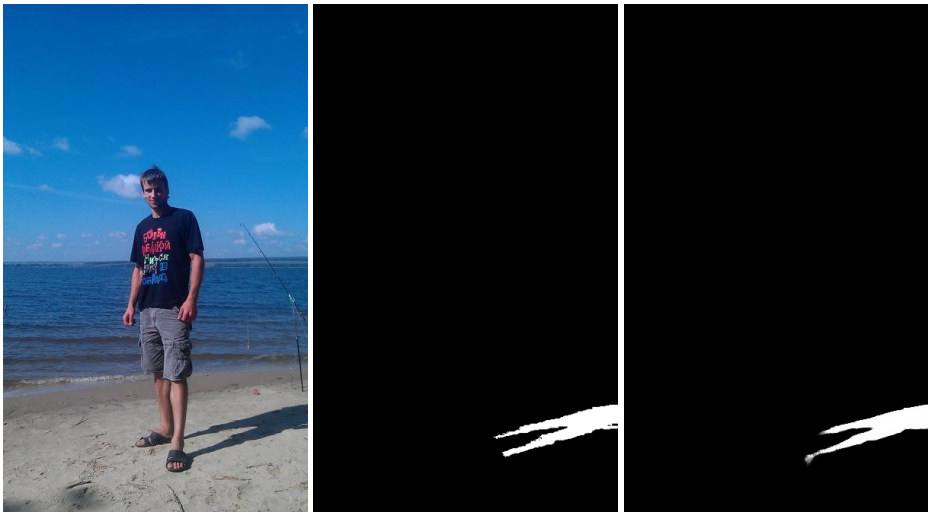


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 7: *More visual comparison results #7 white indicates shadows and black indicates non-shadows).*

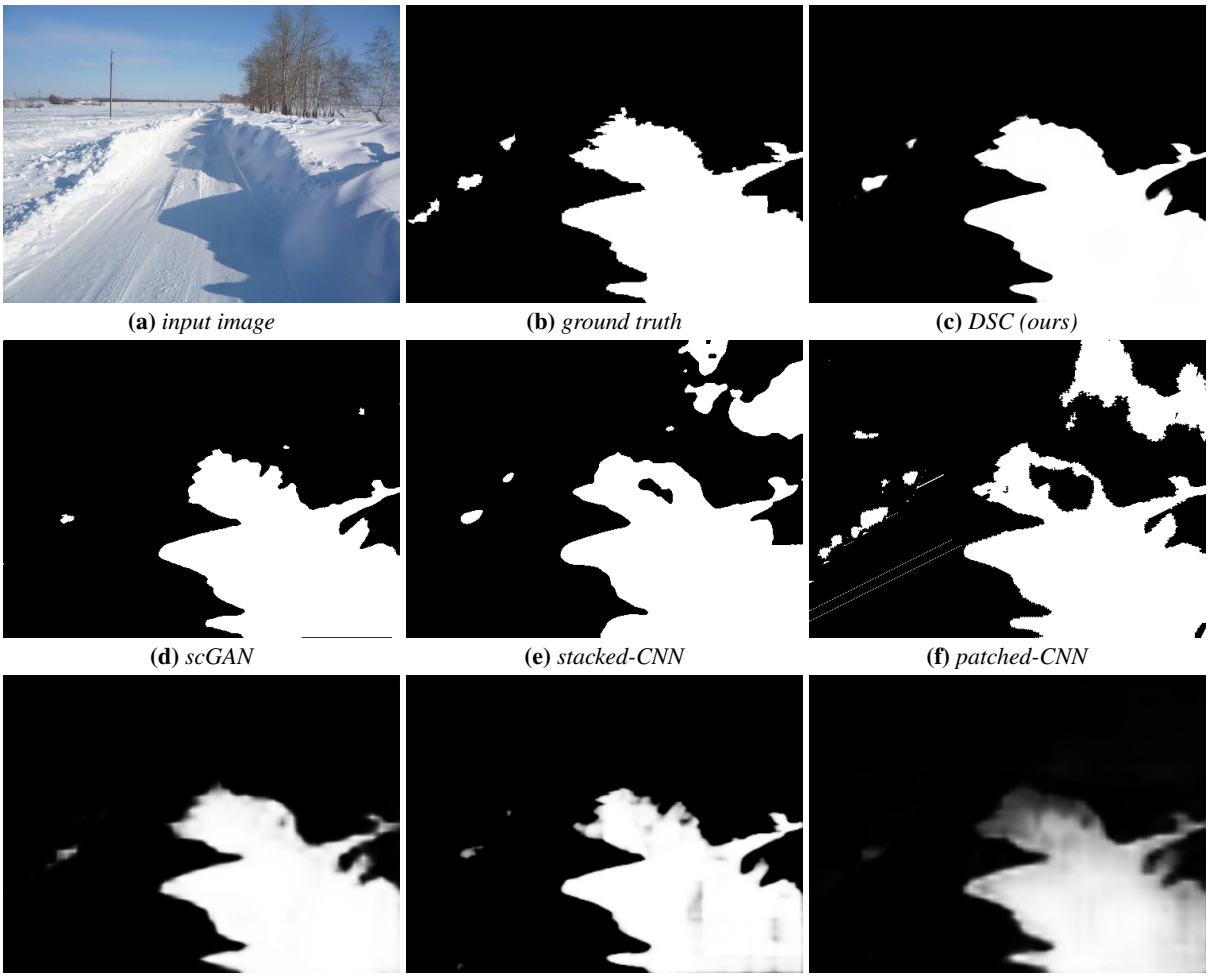


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 8: *More visual comparison results #8 (white indicates shadows and black indicates non-shadows).*

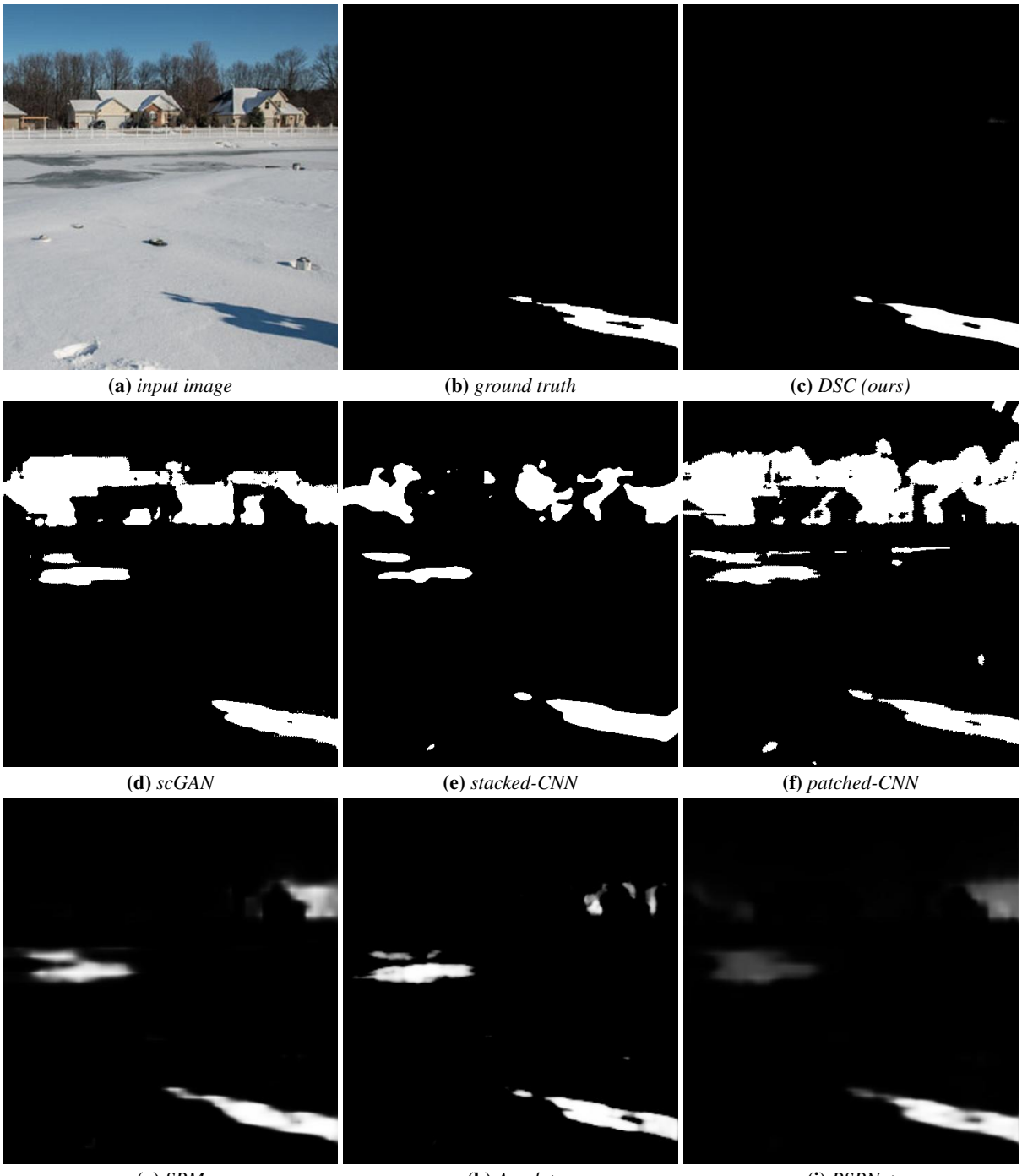


(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 9: *More visual comparison results #9 (white indicates shadows and black indicates non-shadows).*



(a) *input image* **(b)** *ground truth* **(c)** *DSC (ours)*

(d) *scGAN* **(e)** *stacked-CNN* **(f)** *patched-CNN*

(g) *SRM* **(h)** *Amulet* **(i)** *PSPNet*

Figure 10: *More visual comparison results #10 (white indicates shadows and black indicates non-shadows).*

Part 2. Additional Shadow Detection Results

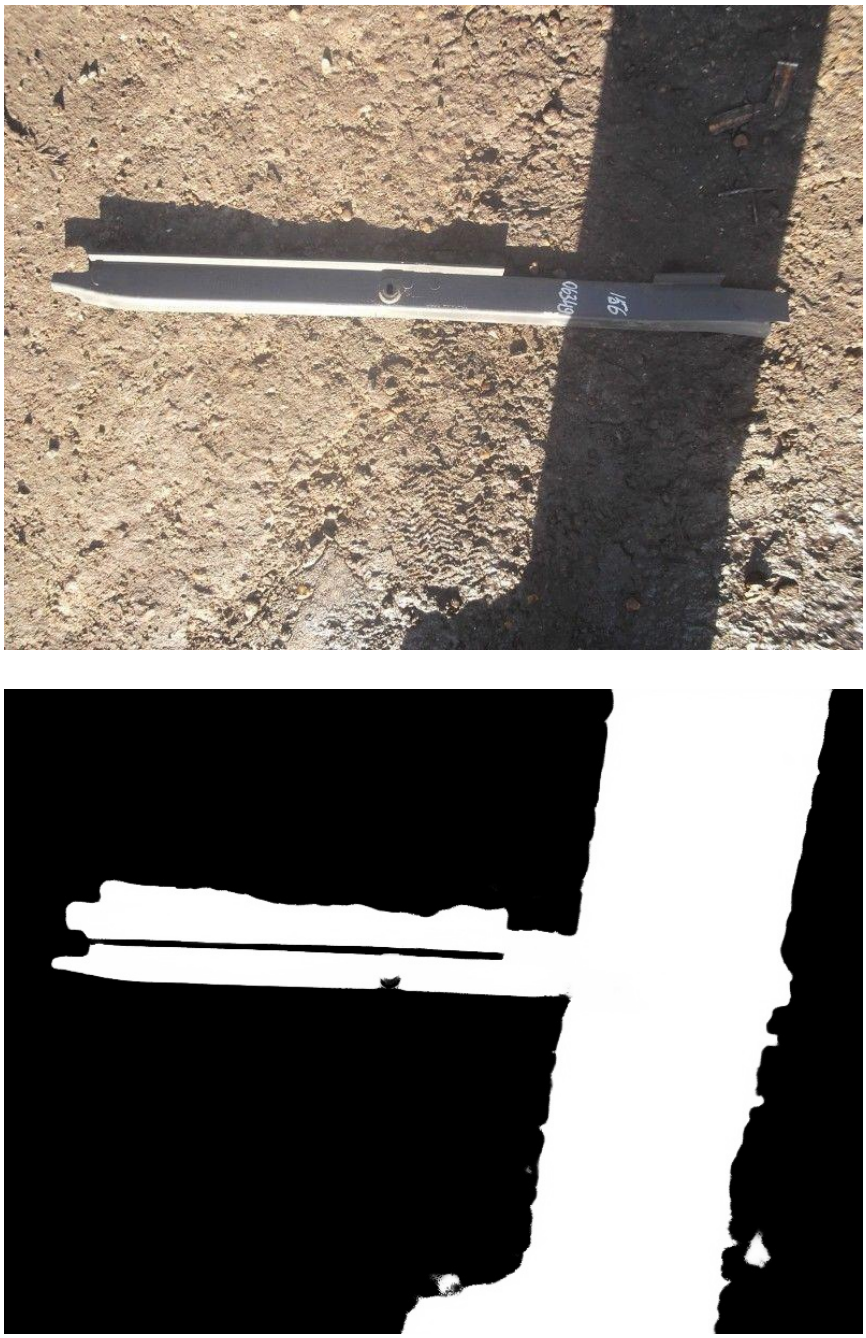


Figure 11: *Additional result #1 from our method. Top row: input photo (real). Bottom row: our result. Our method can effectively detect the shadows of the input image, but it still misses the tiny shadows casted by the tiny stones on the ground.*

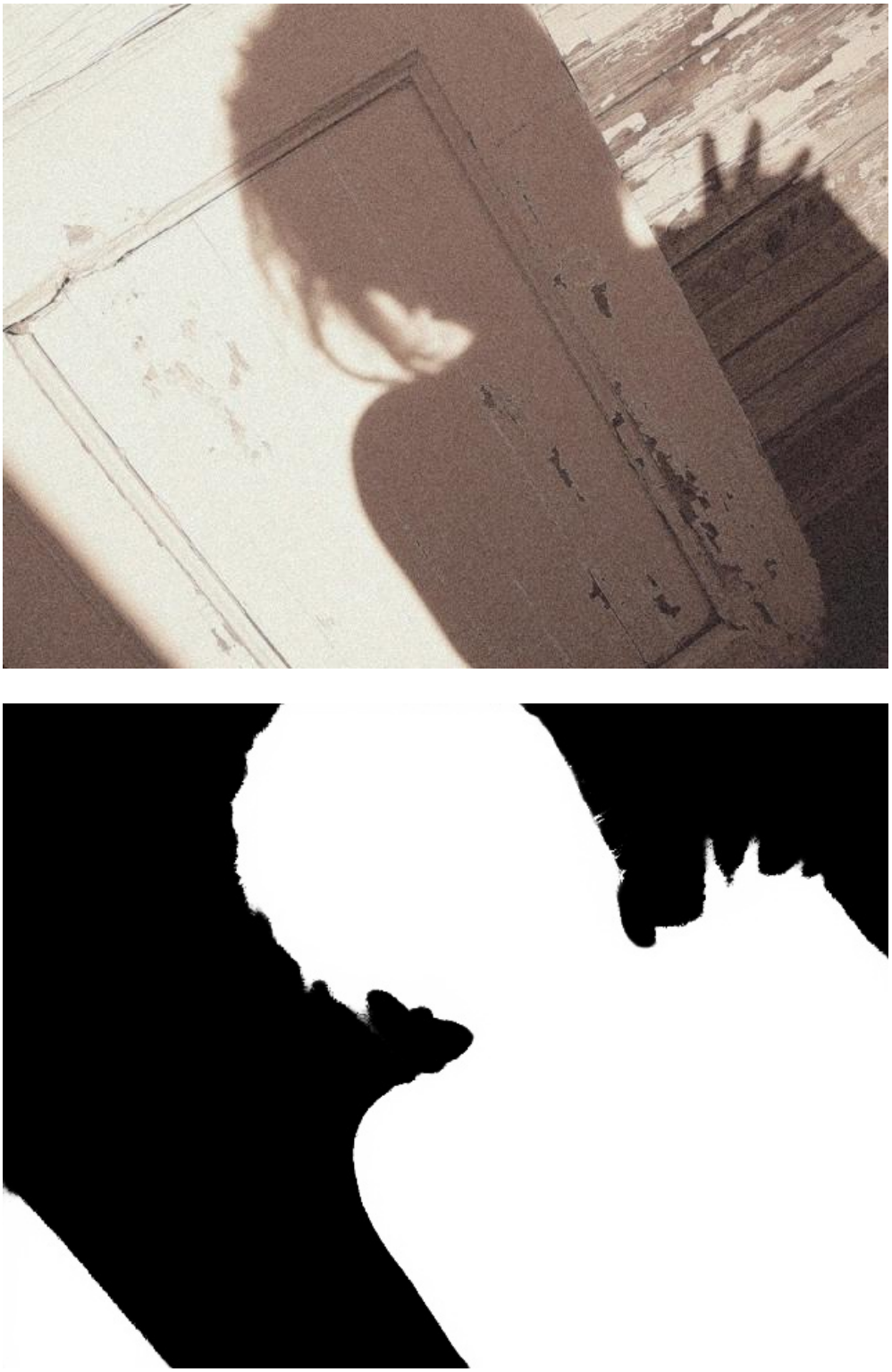


Figure 12: *Additional result #2 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 13: *Additional result #3 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 14: *Additional result #4 from our method. Top row: input photo (real). Bottom row: our result.*

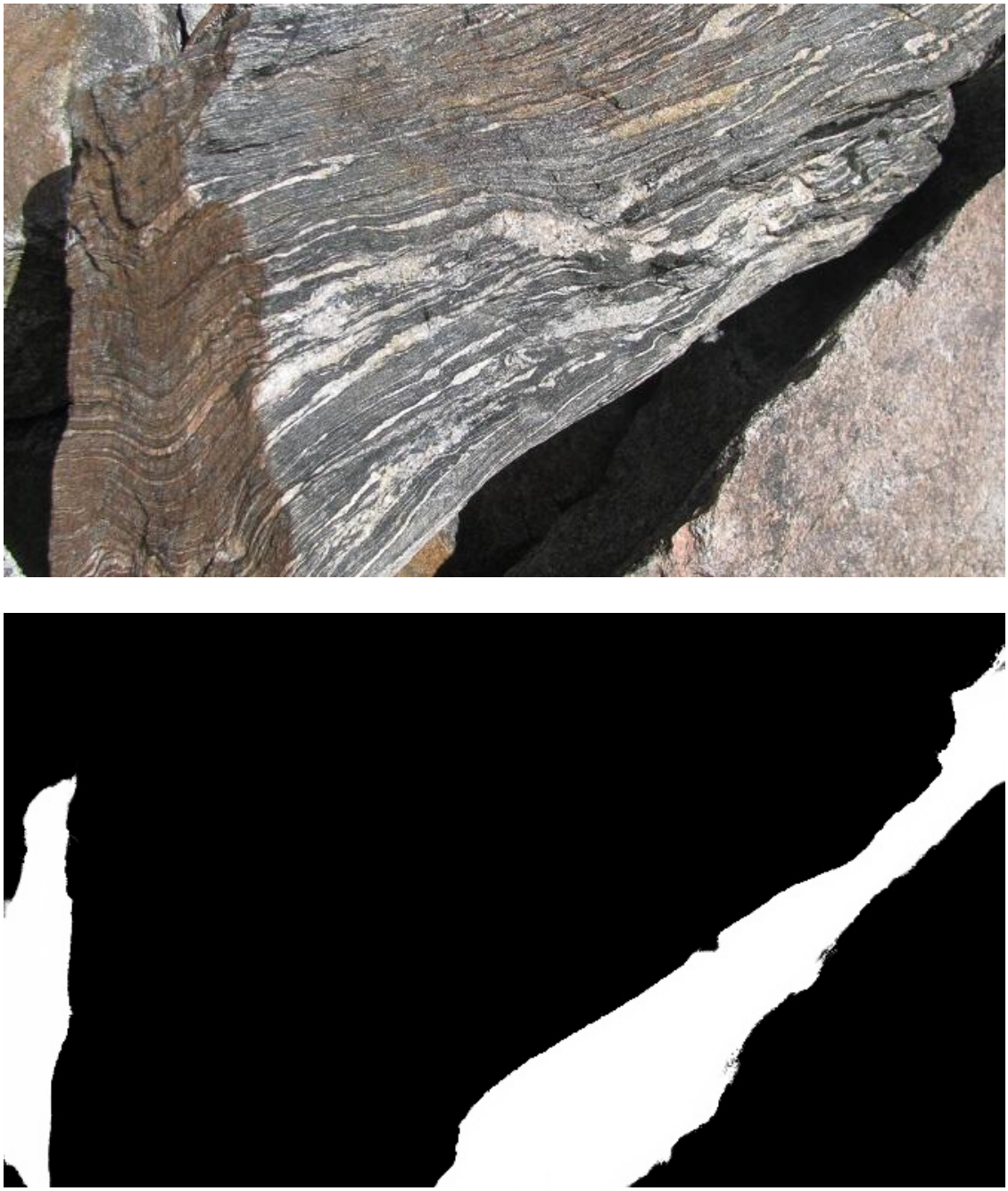


Figure 15: *Additional result #5 from our method. Top row: input photo (real). Bottom row: our result.*

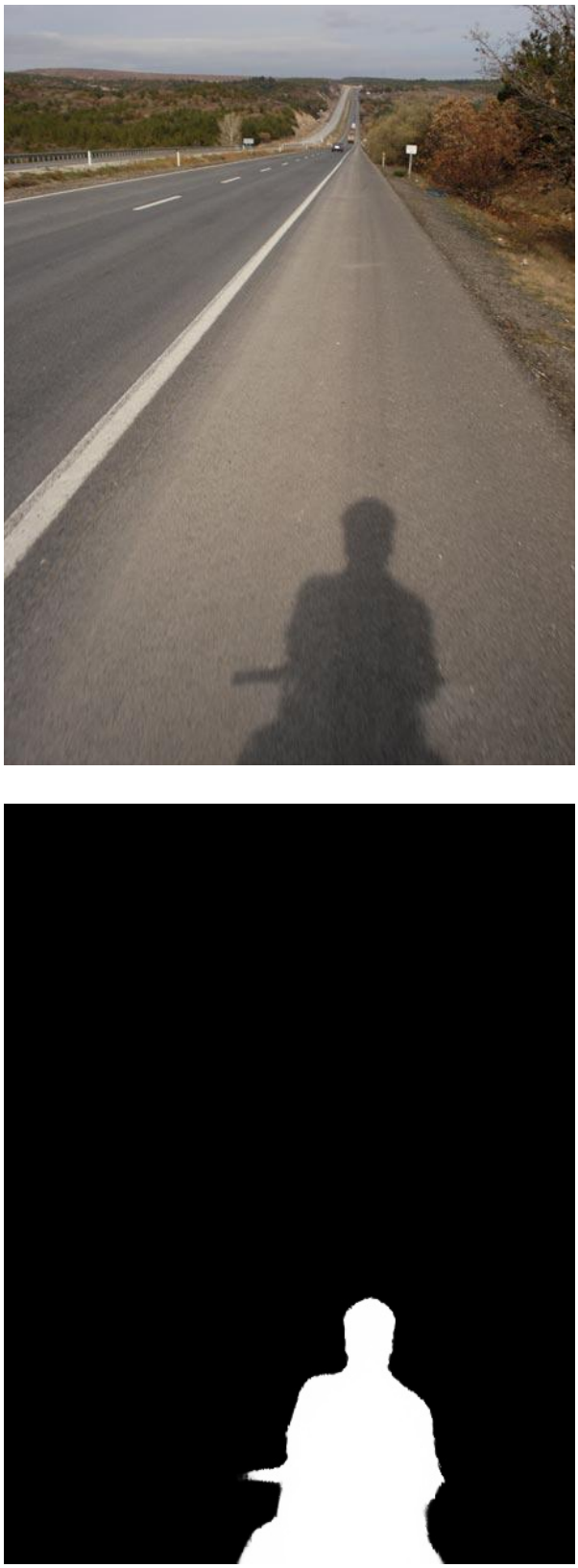


Figure 16: *Additional result #6 from our method. Top row: input photo (real). Bottom row: our result.*

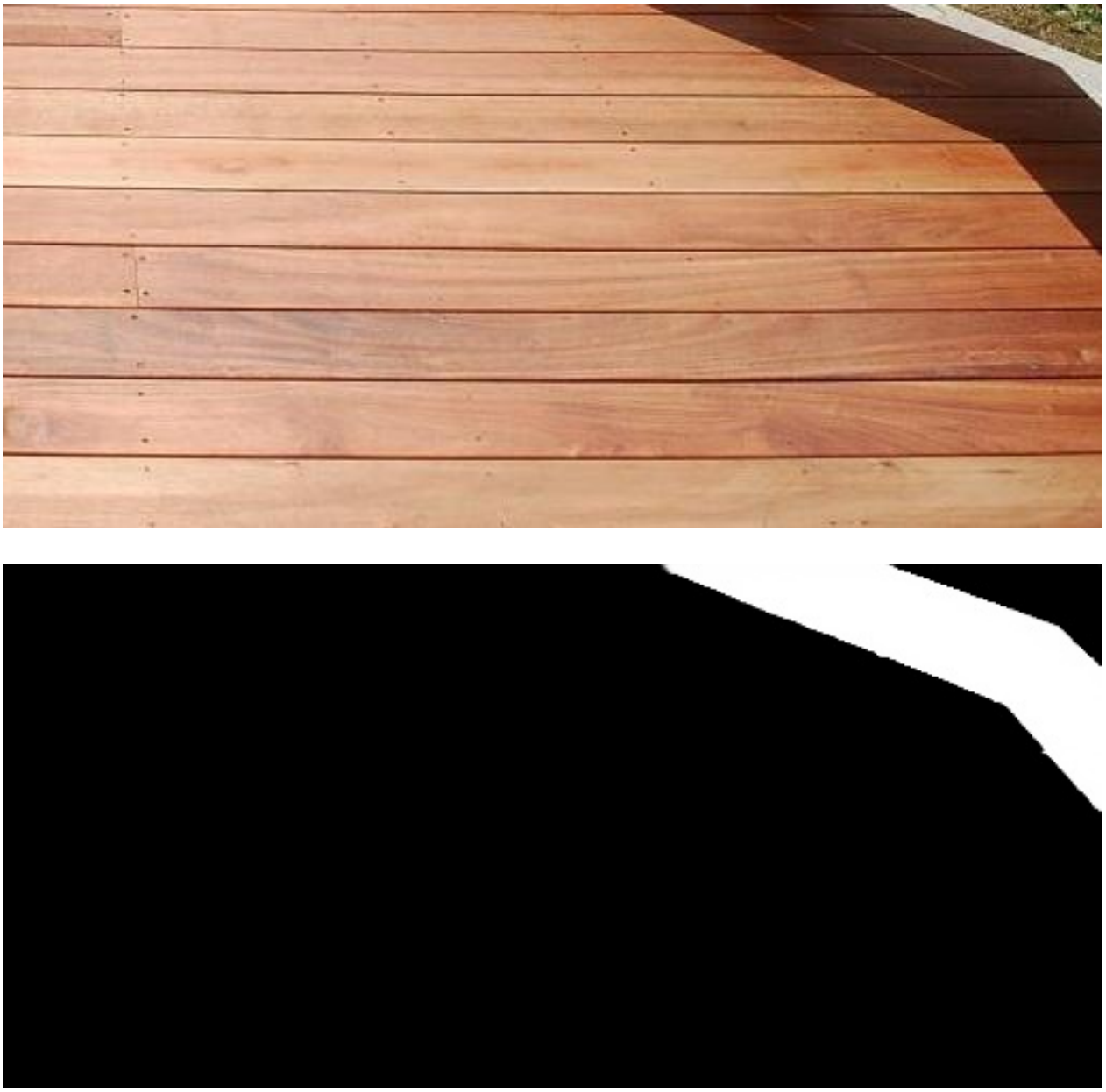


Figure 17: *Additional result #7 from our method. Top row: input photo (real). Bottom row: our result.*

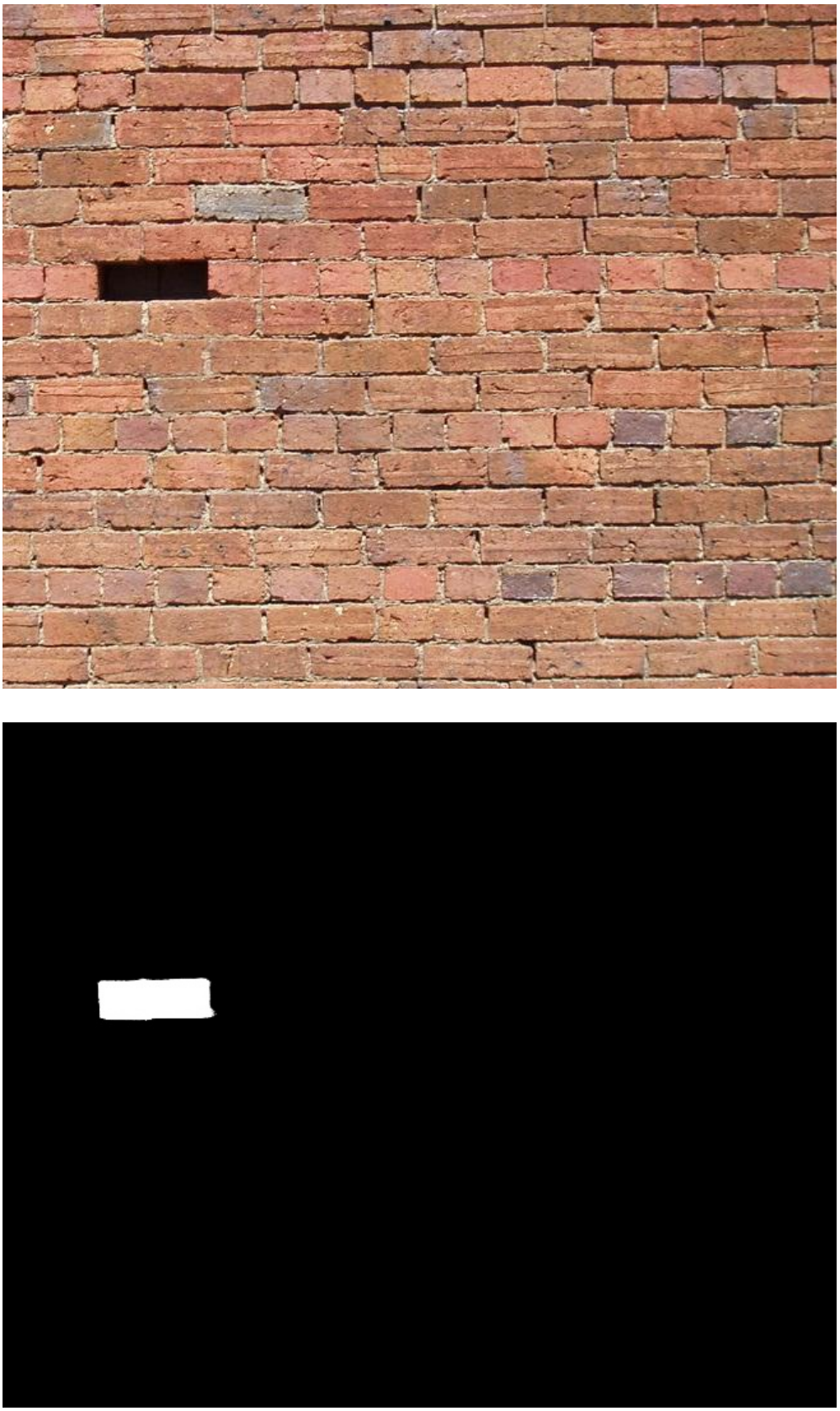


Figure 18: *Additional result #8 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 19: *Additional result #9 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 20: *Additional result #10 from our method. Top row: input photo (real). Bottom row: our result.*

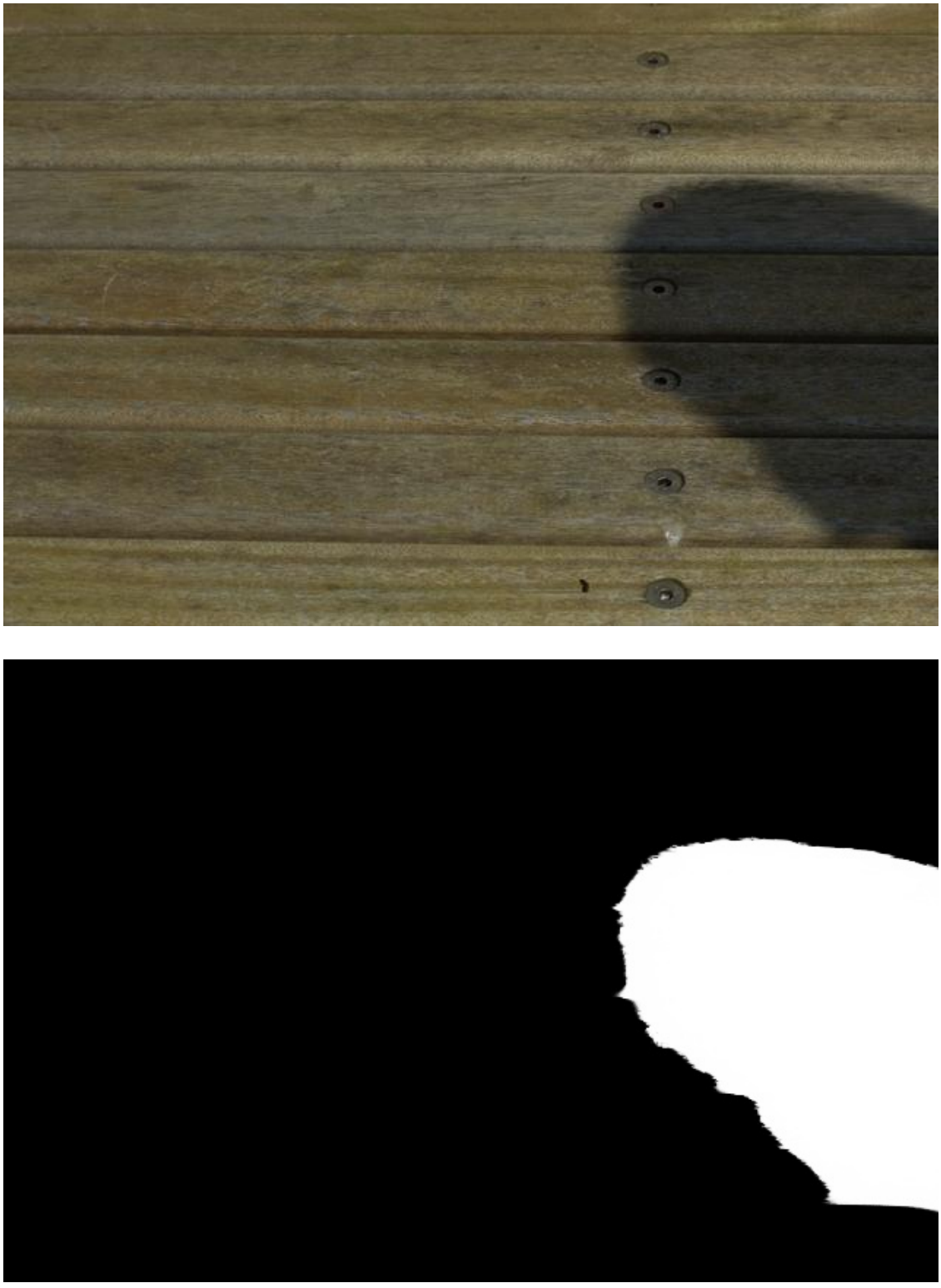


Figure 21: *Additional result #11 from our method. Top row: input photo (real). Bottom row: our result.*

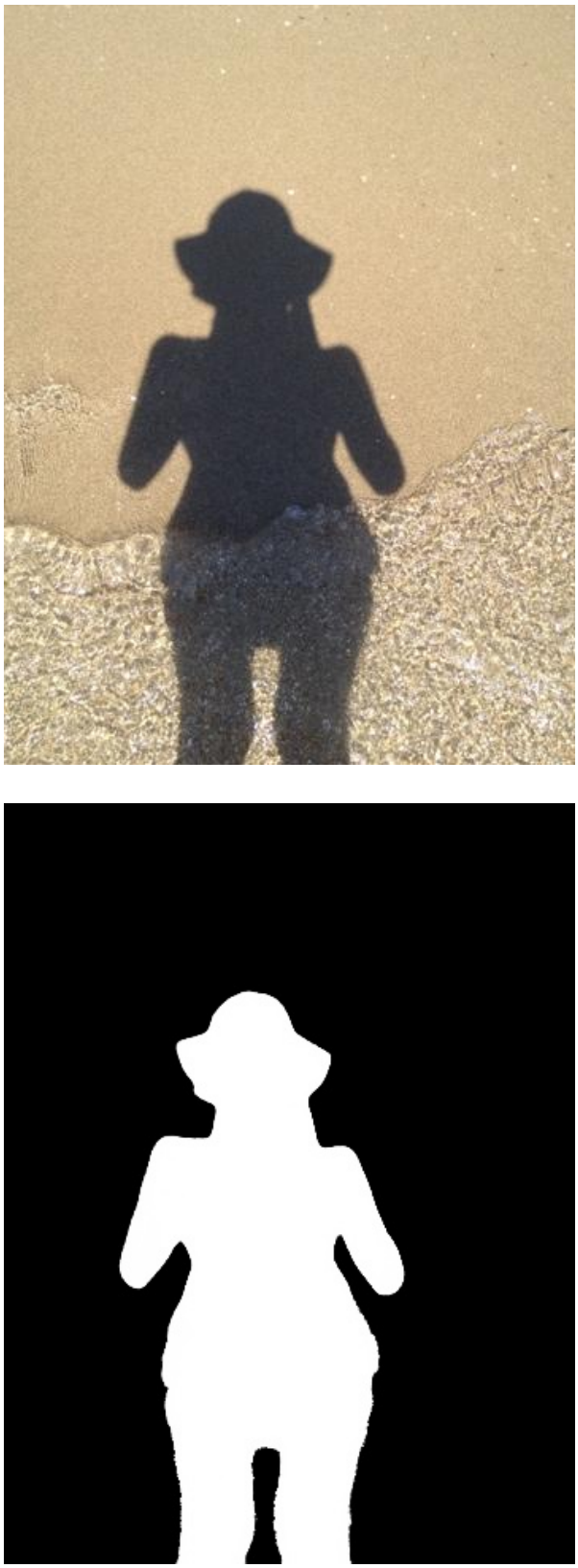


Figure 22: *Additional result #12 from our method. Top row: input photo (real). Bottom row: our result.*

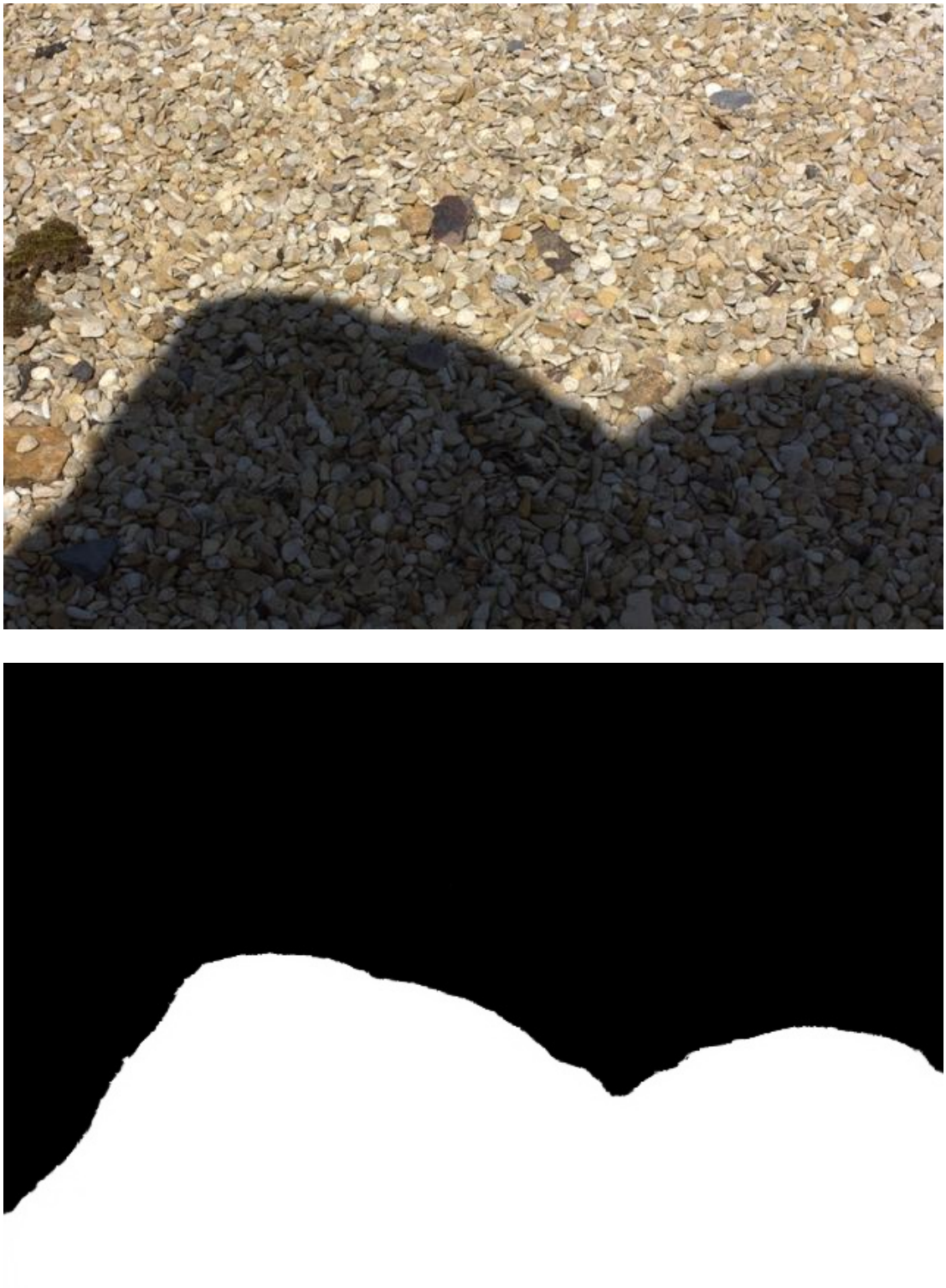


Figure 23: *Additional result #13 from our method. Top row: input photo (real). Bottom row: our result.*

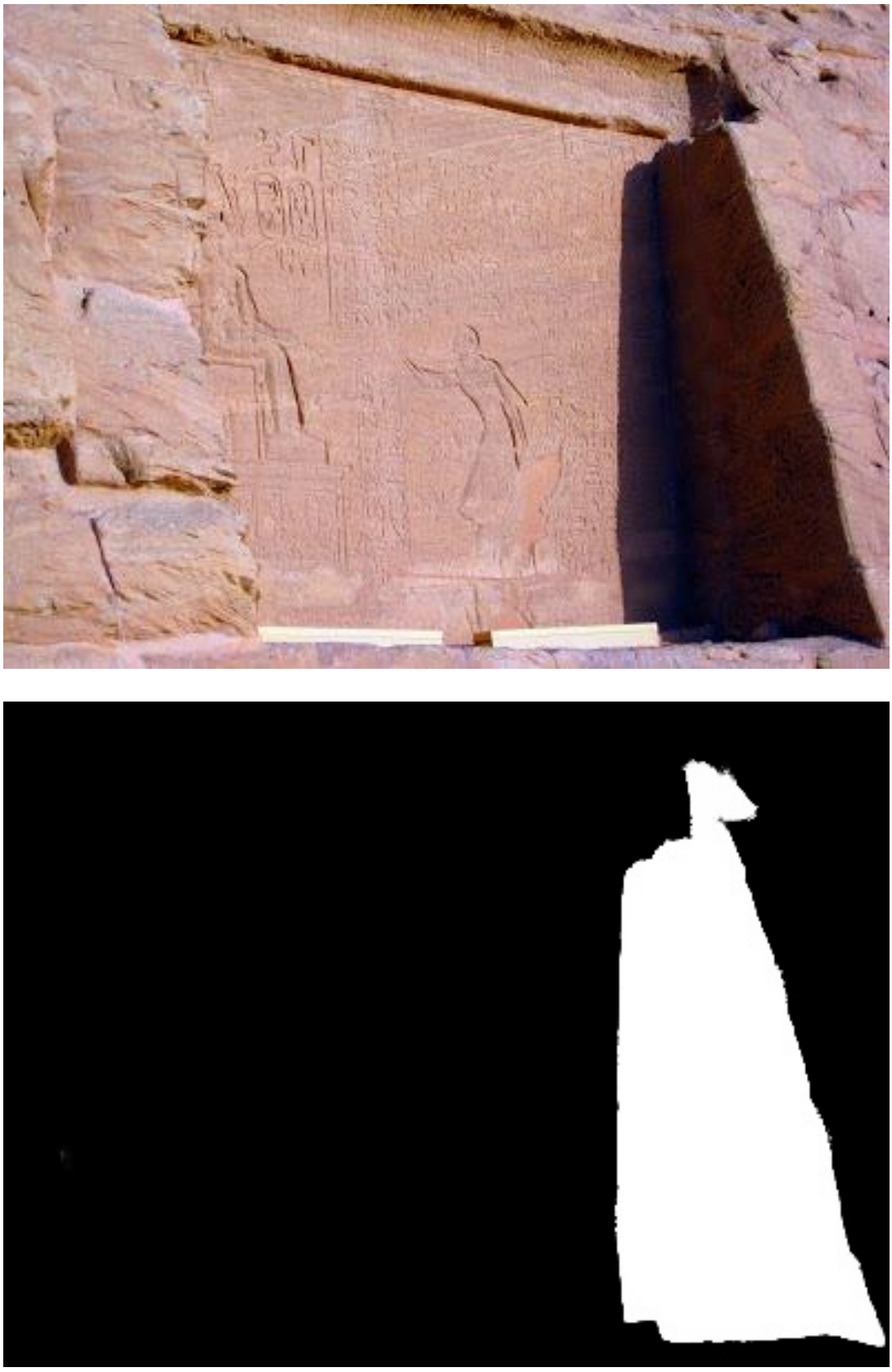


Figure 24: *Additional result #14 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 25: *Additional result #15 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 26: *Additional result #16 from our method. Top row: input photo (real). Bottom row: our result.*

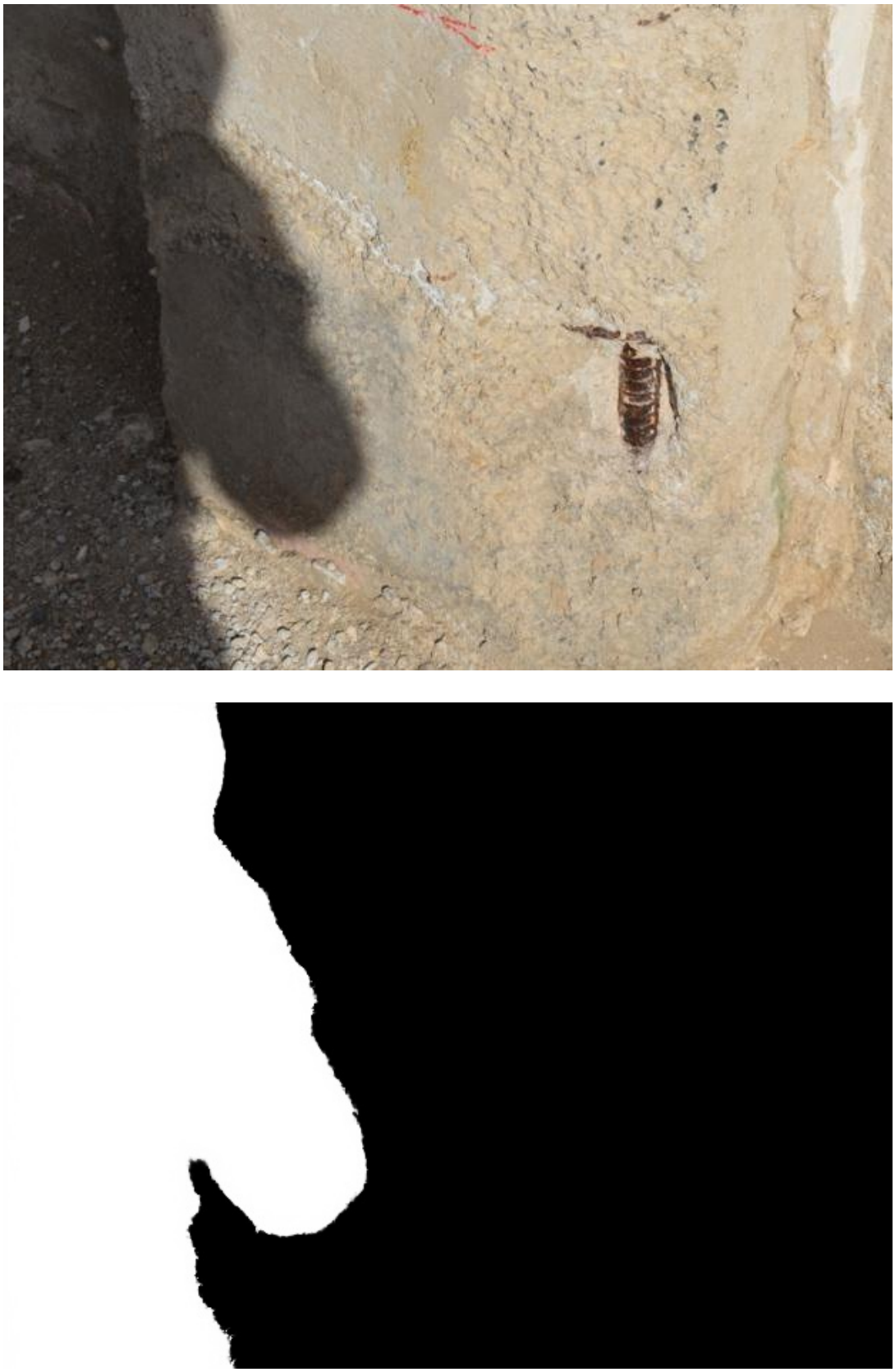


Figure 27: *Additional result #17 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 28: *Additional result #18 from our method. Top row: input photo (real). Bottom row: our result. Our method can effectively detect the shadow regions of the input image, but again, misses the tiny shadows on the ground.*

Figure 29: *Additional result #19 from our method. Top row: input photo (real). Bottom row: our result.*

Figure 30: *Additional result #20 from our method. Top row: input photo (real). Bottom row: our result.*