Supplementary material
AppGen: Interactive Material Modeling from a Single Image

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1 Comparisons

Comparisons to existing material modeling methods Fig. 1 illustrates the shading and reflectance maps generated by our methods, a combination of [Bousseau et al. 2009] and [Wu et al. 2008], and CrazyBump [2010]. The ground truth material map are also provided for reference. The input is taken from the RGBN dataset [Fattal et al. 2007]. The rendering results of these material maps are shown in Figure 9 in the paper.

In generating reference images, we assume that the surface presented by the RGBN data is diffuse and take the RGB value as the albedo. To generate the results shown in Fig. 1 third column, we apply the algorithm in [Bousseau et al. 2009] to separate the input image and then computed the normals from the result shading map with [Wu et al. 2008]. As shown 1, both CrazyBump and the combination of [Bousseau et al. 2009] and [Wu et al. 2008] fail to recover the reflectance and normal maps from the input.

Comparisons to automatic intrinsic image methods In Fig. 2, we compare our method with other automatic intrinsic image methods. The benchmark dataset and algorithm implementations are provided by [Grosse et al. 2009]. To generate the result shown in the figure, we don't use any user input in our method. Although our method is designed for texture input, it can also generate reasonable results for the benchmark image shown in Figure 2.

Comparisons to procedural methods In Fig. 3, we compare the result generated by our method with results generated by [Gilet and Dischler 2010]. The input Fig. 3.a and result Fig. 3.d are directly copied from [Gilet and Dischler 2010].

2 Rendering Results

Fig. 4 to 9 show more rendering results of examples shown in the paper. The reflectance map and normal map of examples modeled by our method are also shown in the figures.

Fig. 12 to 18 show more examples generated by our method. Input image and user interaction strokes are also provided in the figures.

References

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CLARK, R., 2010. Crazybump. http://www.crazybump.com/.

FATTAL, R., AGRAWALA, M., AND RUSINKIEWICZ, S. 2007. Multiscale shape and detail enhancement from multi-light image collections. In *ACM SIGGRAPH 2007 papers*, ACM, New York, NY, USA, SIGGRAPH '07.

GILET, G., AND DISCHLER, J.-M. 2010. An image-based approach for stochastic volumetric and procedural details. *Comput. Graph. Forum 29*, 4, 1411–1419.

GROSSE, R., JOHNSON, M., ADELSON, E., AND FREEMAN, W. 2009. Ground truth dataset and baseline evaluations for intrinsic image algorithms. In *Computer Vision, 2009 IEEE 12th International Conference on*, 2335 –2342.

WU, T.-P., SUN, J., TANG, C.-K., AND SHUM, H.-Y. 2008. Interactive normal reconstruction from a single image. *ACM Trans. Graph. 27*, 5, 1–9.

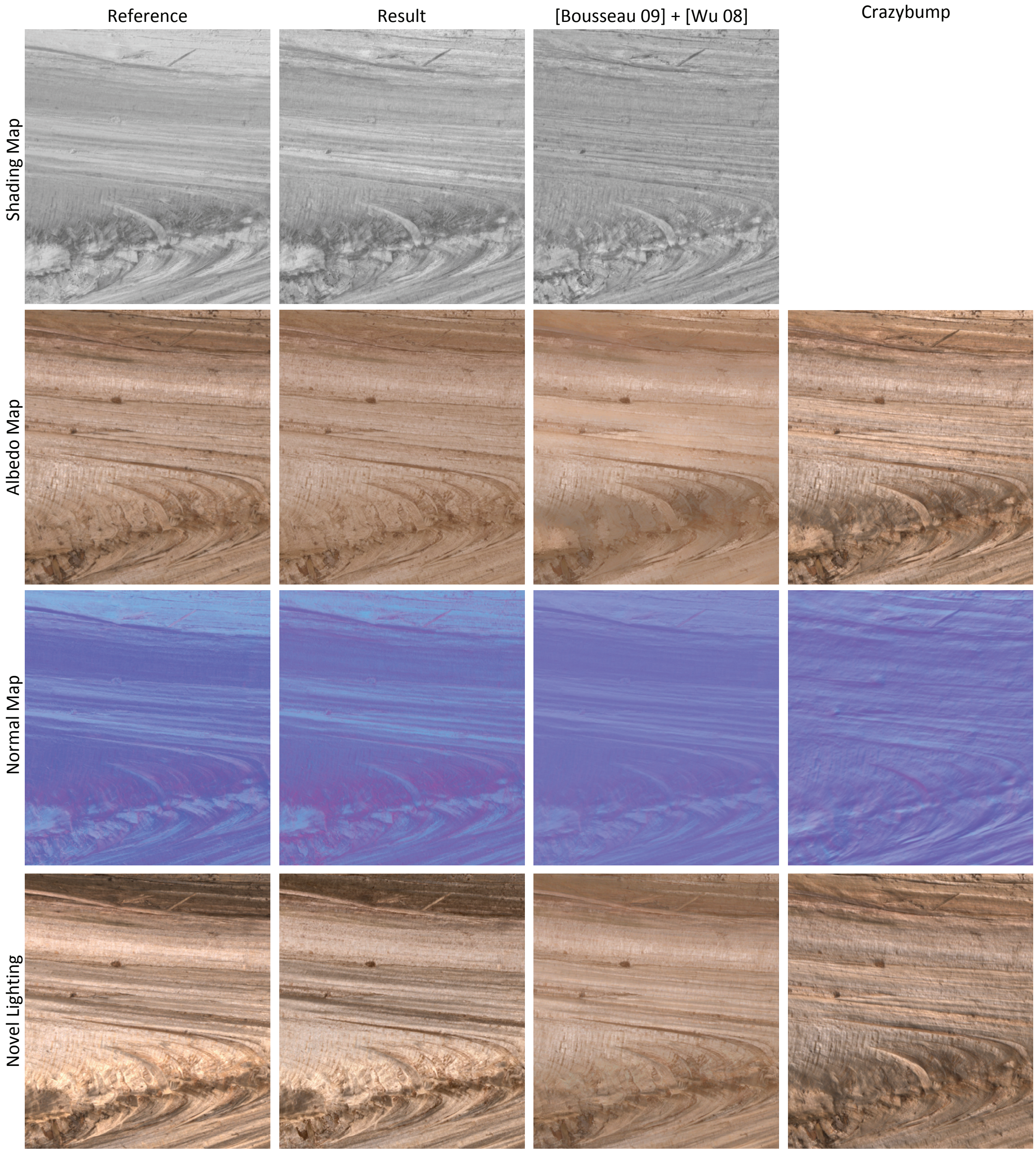


Figure 1: *Comparisons with prior work. The first two rows are separated shading and albedo maps of the input image. The third row shows the reconstructed normal maps. The final rendering results under novel lighting condition are shown in the bottom row. Ground truth reference and results of different methods are arranged in columns.*

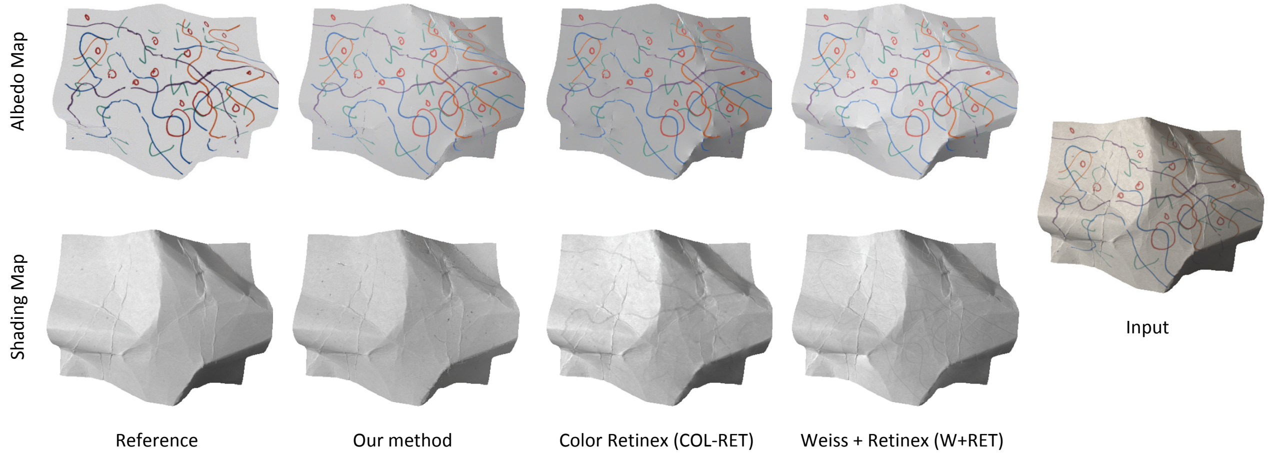


Figure 2: *Comparison to automatic intrinsic image methods. The benchmark dataset and algorithm implementations are provided by [Grosse et al. 2009]*

Figure 3: *Comparison with [Gilet and Dischler 2010]. (a) Input image (b) Rendering result of our methods under novel lighting condition. (c) Rendering result of a sphere with material maps generated by our method. (d) failure result generated by [Gilet and Dischler 2010]. The image is directly copied from [Gilet and Dischler 2010].*

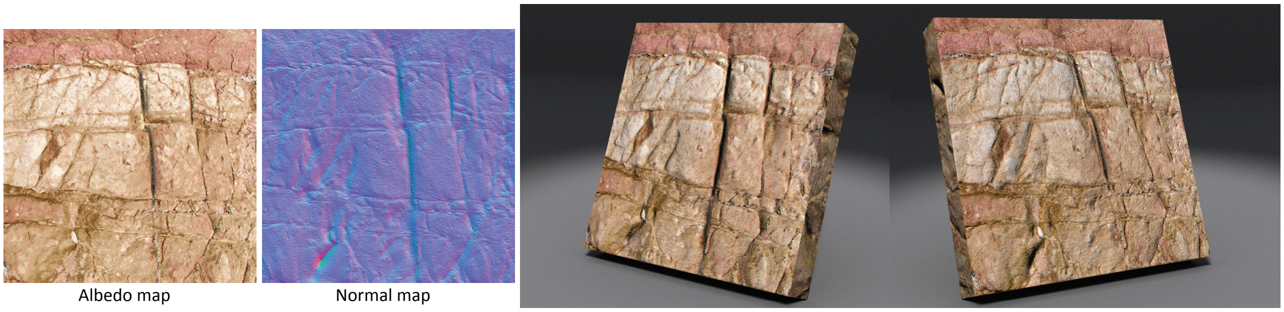


Figure 4: *Rock generated by our system. Please reference Figure 11.a in the paper for the input and user interactions.*

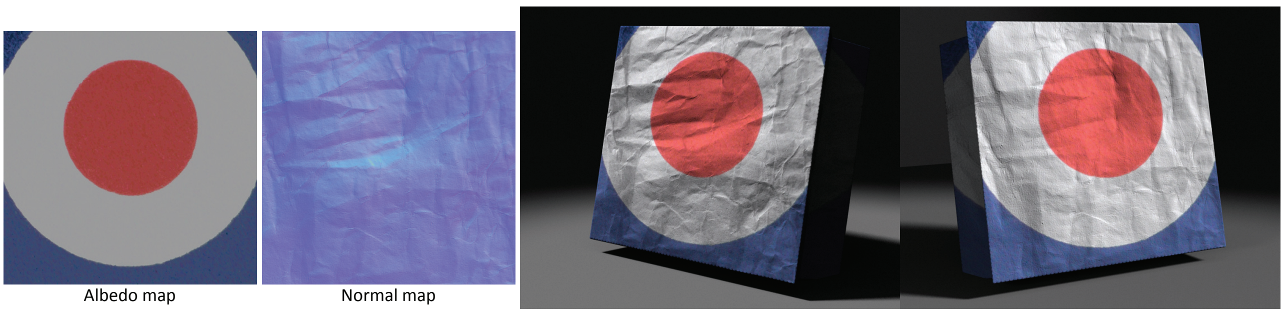


Figure 5: *Wrinkled paper generated by our system. Please reference Figure 12.a in the paper for the input and user interactions.*

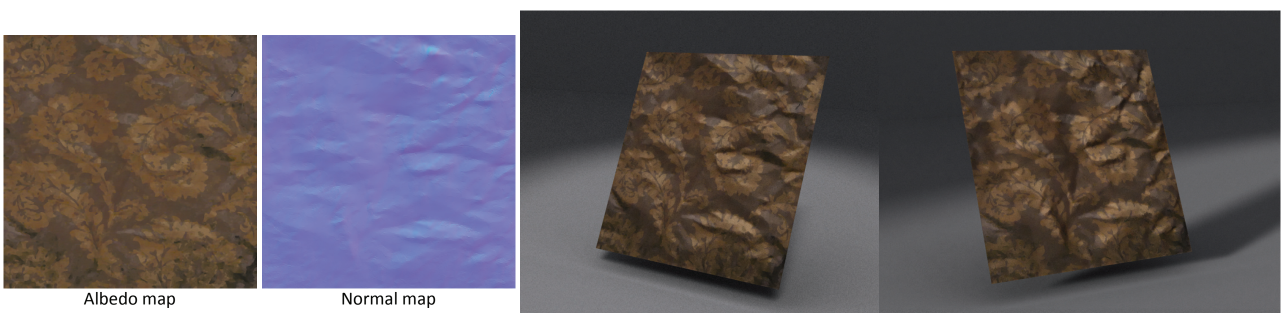


Figure 6: *Wrinkled paper generated by our system. Please reference Figure 12.c in the paper for the input and user interactions.*

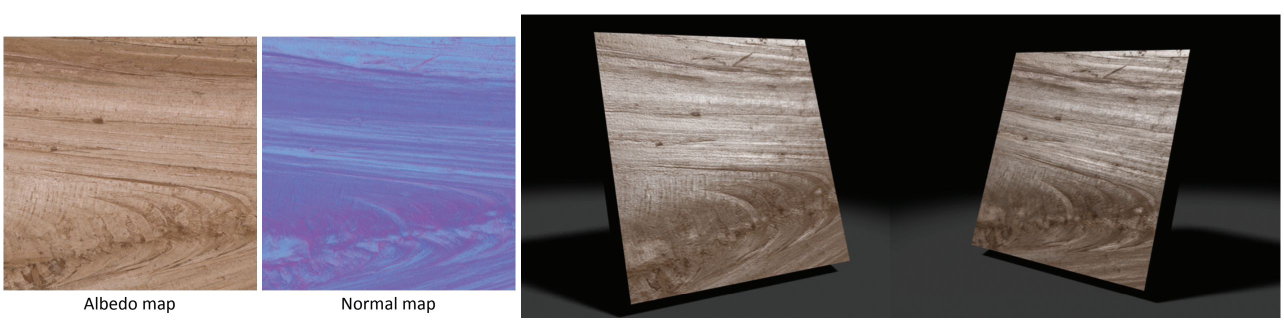


Figure 7: *Finished wood generated by our system. Please reference Figure 13.a in the paper for the input and user interactions.*

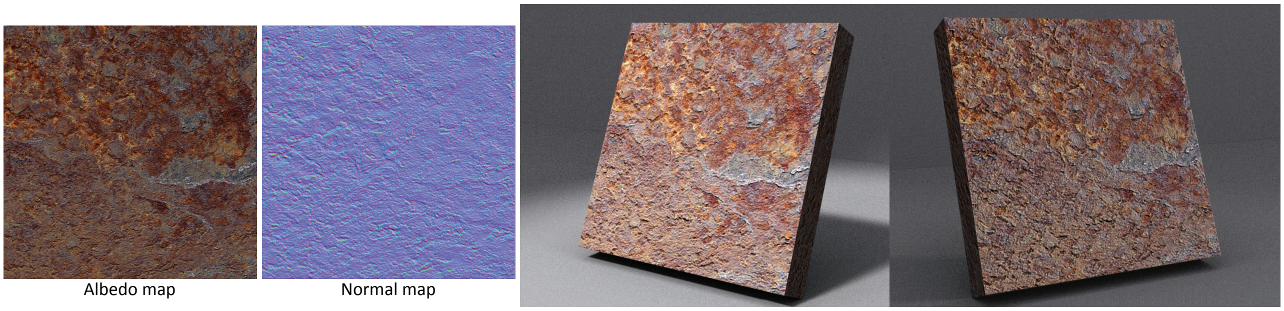


Figure 8: *Rusted metal generated by our system. Please reference Figure 13.c in the paper for the input and user interactions.*

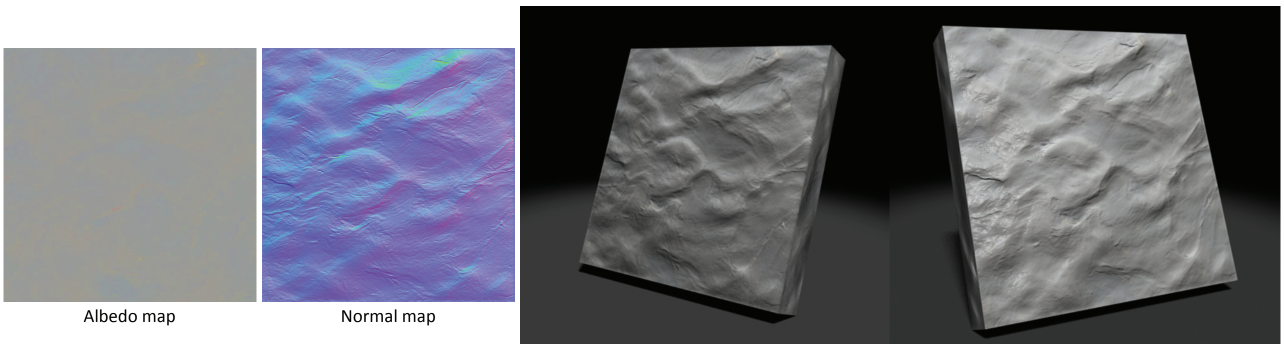


Figure 9: *Stone example generated by our system. Please reference the supplementary video for the input and more rendering results.*

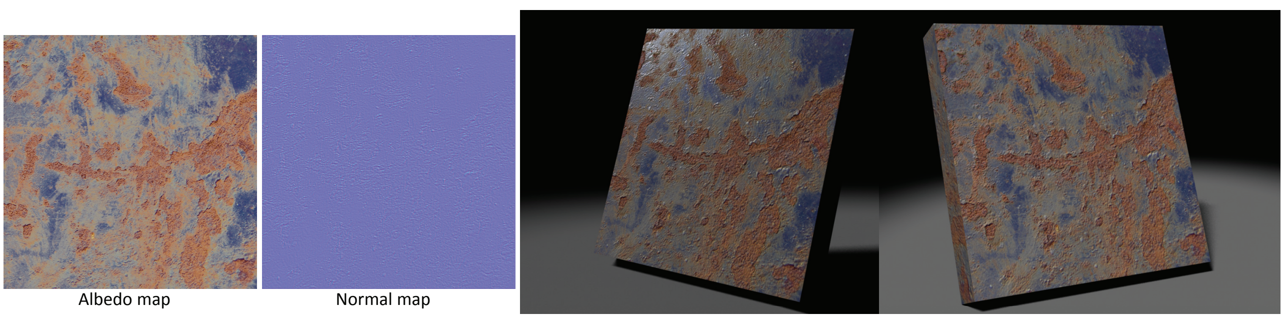


Figure 10: *Rust metal generated by our system. Please reference Figure 14.a in the paper for the input and user interactions.*

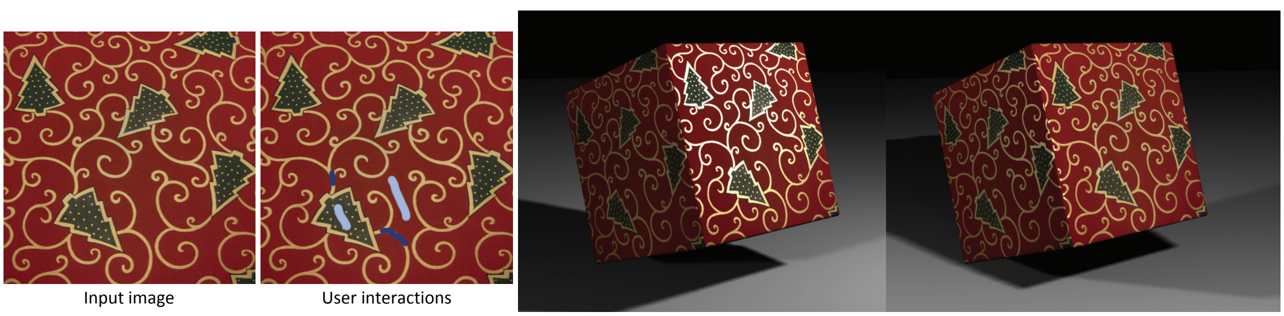
Figure 11: *Wood carving generated by our system. Please reference Figure 15.a in the paper for the input and user interactions.*

Input image User interactions

Figure 12: *Grammy square ground generated by our system.*

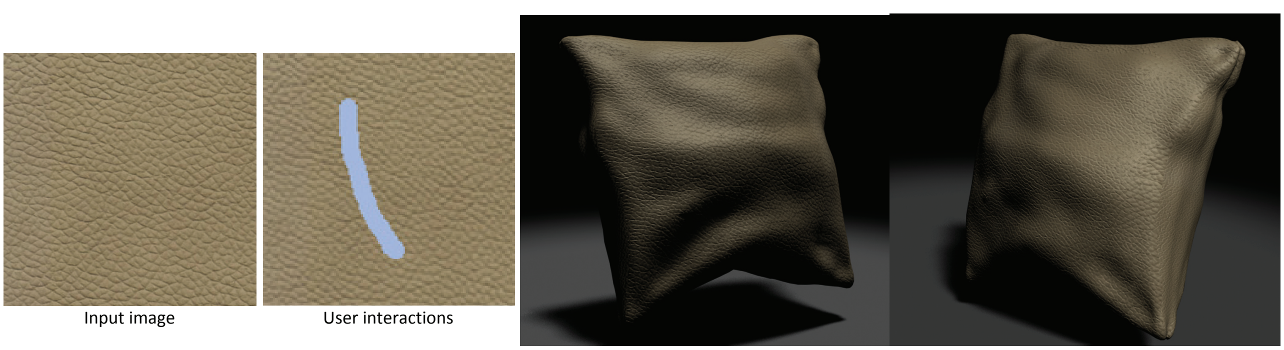
Input image User interactions

Figure 13: *Hard cover book generated by our system.*



Input image User interactions

Figure 14: *Wrapping paper example generated by our system.*



Input image User interactions

Figure 15: *Leather generated by our system.*

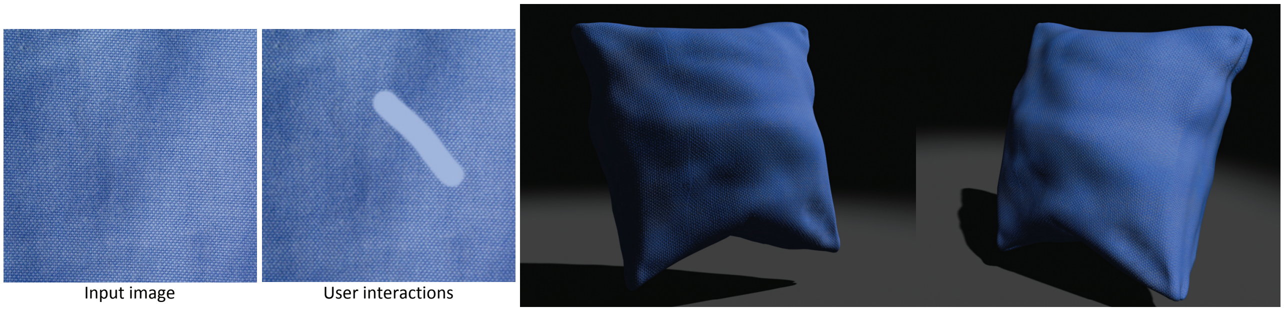


Figure 16: *Fiber textiles generated by our system.*

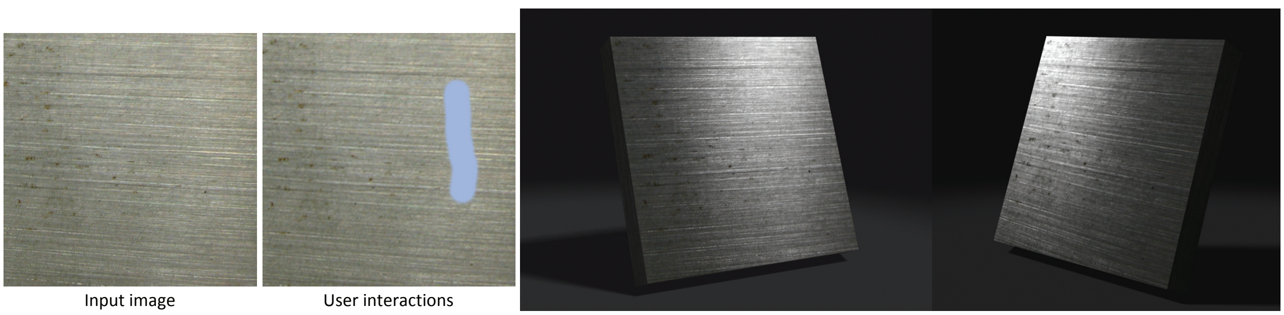


Figure 17: *Rusted metal generated by our system.*

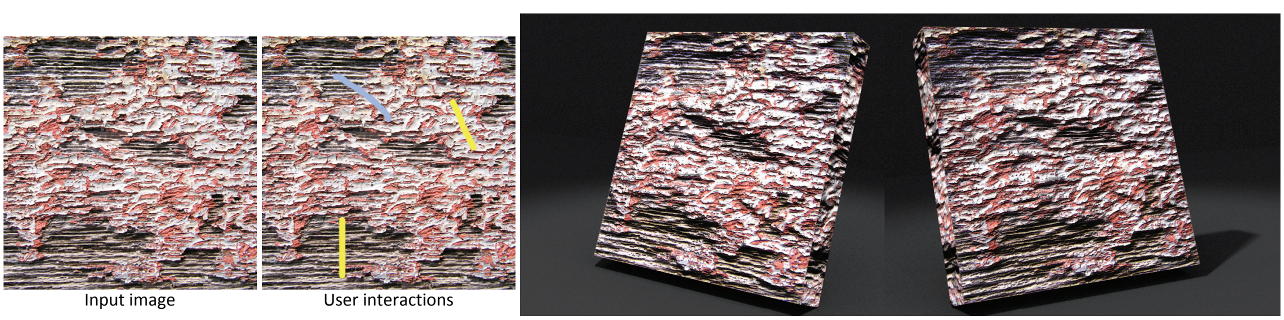


Figure 18: *Weathered paint generated by our system.*