

Neural Intersection Function: Supplemental Material

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1 Full-resolution Rendered Results

We show rendered results of 10 scenes at full resolution. The BISTRO scene is rendered after 64 training spp with 128 inference spp while other scenes are rendered after 32 training spp with 128 inference spp. We render all images on an AMD Radeon™ RX 7900 XT GPU at 1920×1080 screen resolution.

1.1 Images for Image-based Lighting

Fig. 1 shows two HDR images used for image-based lighting (IBL) in our experiments. Fig. 1a is relatively low-frequency and its resolution is 3000×1500 . The resolution of Fig. 1b is 4096×2048 .

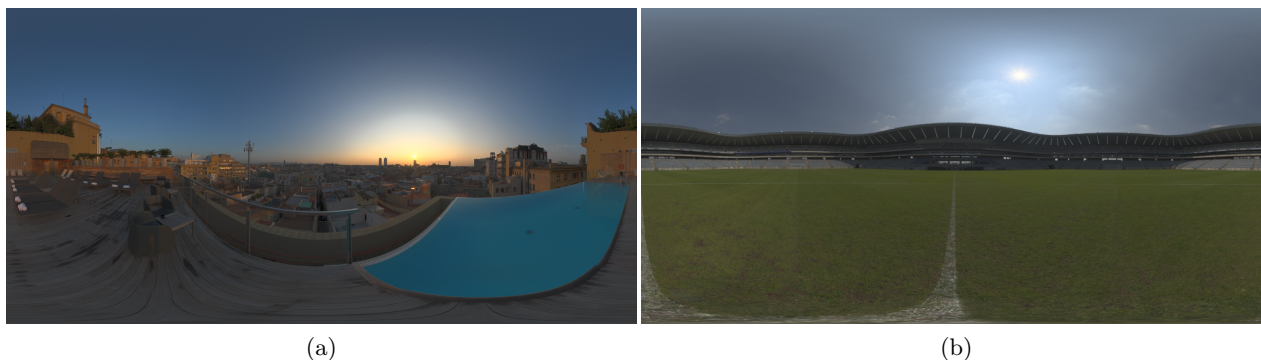


Figure 1: *HDR images used for image-based lighting.*

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1.2 BISTRO

Fig. 2 - Fig. 4 show the rendered results of the scene where 6 complex models are placed in the BISTRO scene. For this scene, we execute NIF only for the complex models which have more than 100K triangles while we traverse BVHs for other simple geometries. This scene contains 30M triangles and Fig. 1b is used for IBL.



Figure 2: *The BISTRO scene rendered using NIF after 64 training spp.*



Figure 3: *The BISTRO scene rendered using ray casting with BVH.*



Figure 4: *Difference between Fig. 2 and Fig. 3 $\times 3$.*

1.3 DRAGON A

Fig. 5 - Fig. 7 show the rendered results of the DRAGON A scene. This scene contains 7.2M triangles and Fig. 1a is used for IBL.



Figure 5: *The DRAGON A scene rendered using NIF after 32 training spp.*



Figure 6: *The DRAGON A scene rendered using ray casting with BVH.*

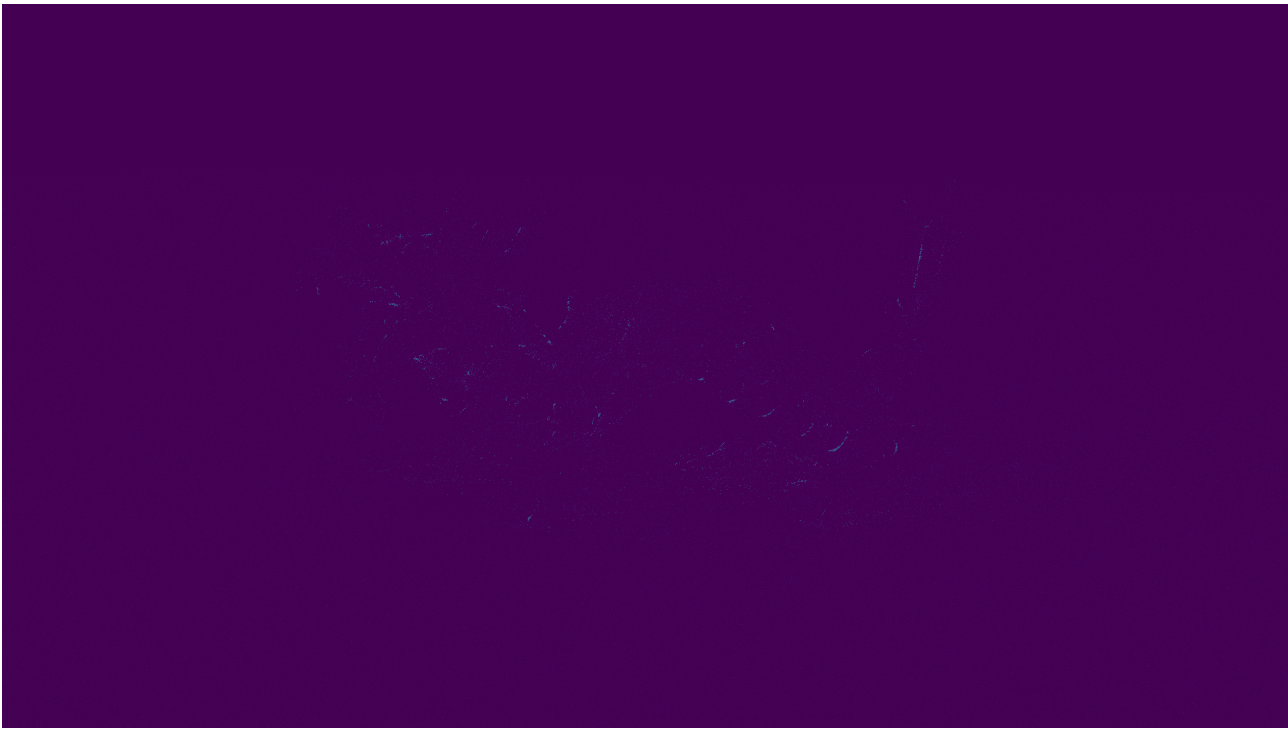


Figure 7: *Difference between Fig. 5 and Fig. 6 $\times 3$.*

1.4 DRAGON B

Fig. 8 - Fig. 10 show the rendered results of the DRAGON B scene. This scene contains 7.2M triangles and Fig. 1b is used for IBL.



Figure 8: *The DRAGON B scene rendered using NIF after 32 training spp.*



Figure 9: *The DRAGON B scene rendered using ray casting with BVH.*

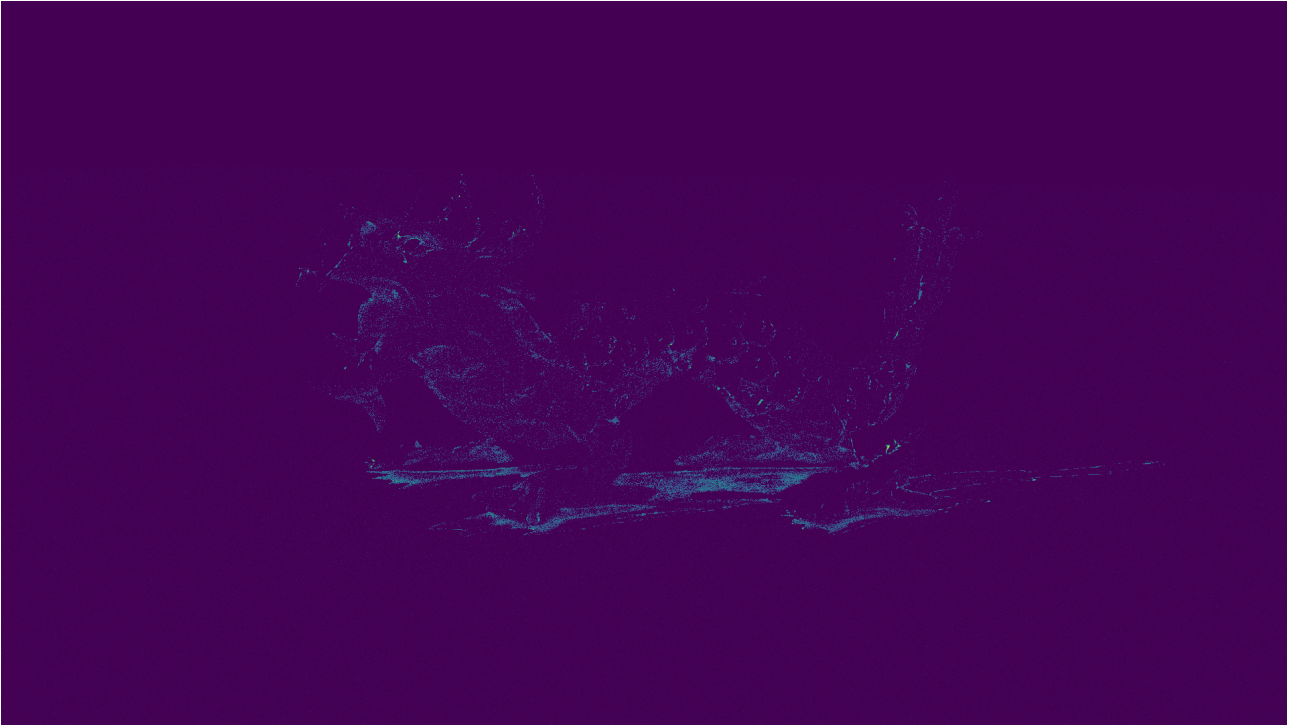


Figure 10: *Difference between Fig. 8 and Fig. 9 $\times 3$.*

1.5 CENTAUR A

Fig. 11 - Fig. 13 show the rendered results of the CENTAUR A scene. This scene contains 2.5M triangles and Fig. 1a is used for IBL.



Figure 11: *The CENTAUR A scene rendered using NIF after 32 training spp.*



Figure 12: *The CENTAUR A scene rendered using ray casting with BVH.*



Figure 13: *Difference between Fig. 11 and Fig. 12 $\times 3$.*

1.6 CENTAUR B

Fig. 14 - Fig. 16 show the rendered results of the CENTAUR B scene. This scene contains 2.5M triangles and Fig. 1b is used for IBL.



Figure 14: *The CENTAUR B scene rendered using NIF after 32 training spp.*



Figure 15: *The CENTAUR B scene rendered using ray casting with BVH.*

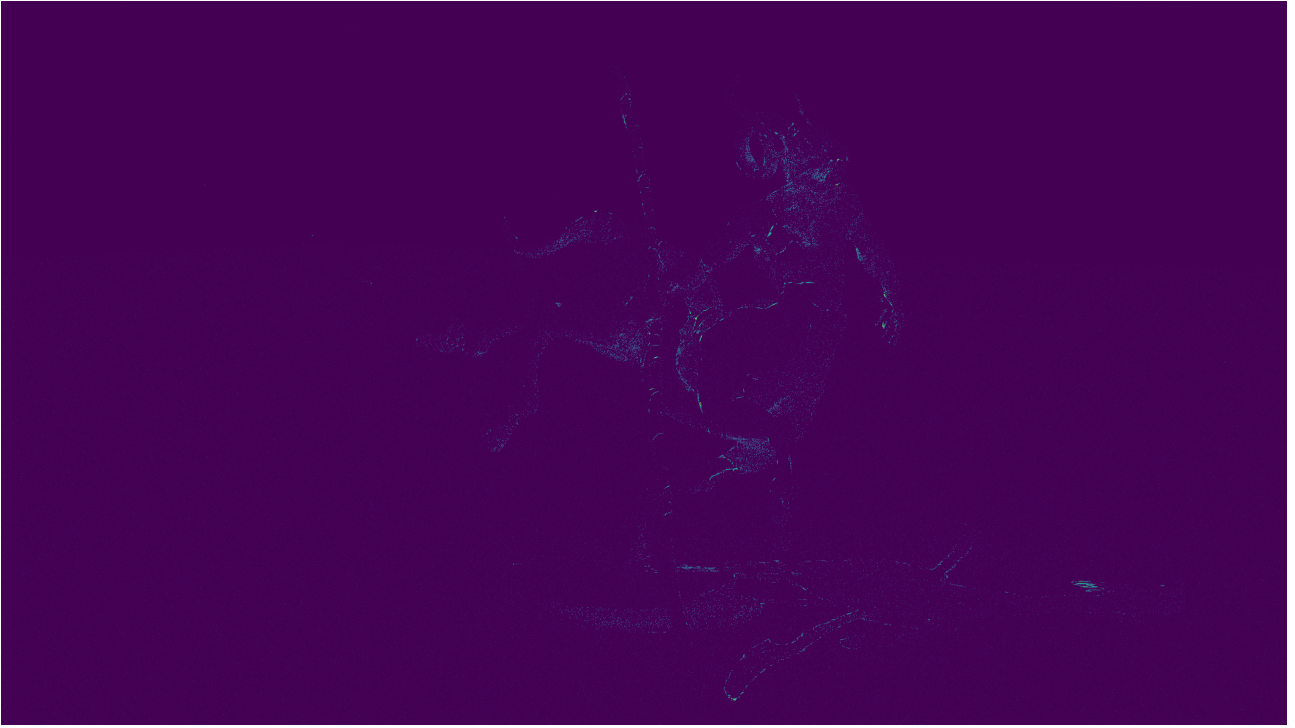


Figure 16: *Difference between Fig. 14 and Fig. 15 $\times 3$.*

1.7 THAI STATUE

Fig. 17 - Fig. 19 show the rendered results of the THAI STATUE scene. This scene contains 10M triangles and Fig. 1b is used for IBL.



Figure 17: *The THAI STATUE scene rendered using NIF after 32 training spp.*



Figure 18: *The THAI STATUE scene rendered using ray casting with BVH.*

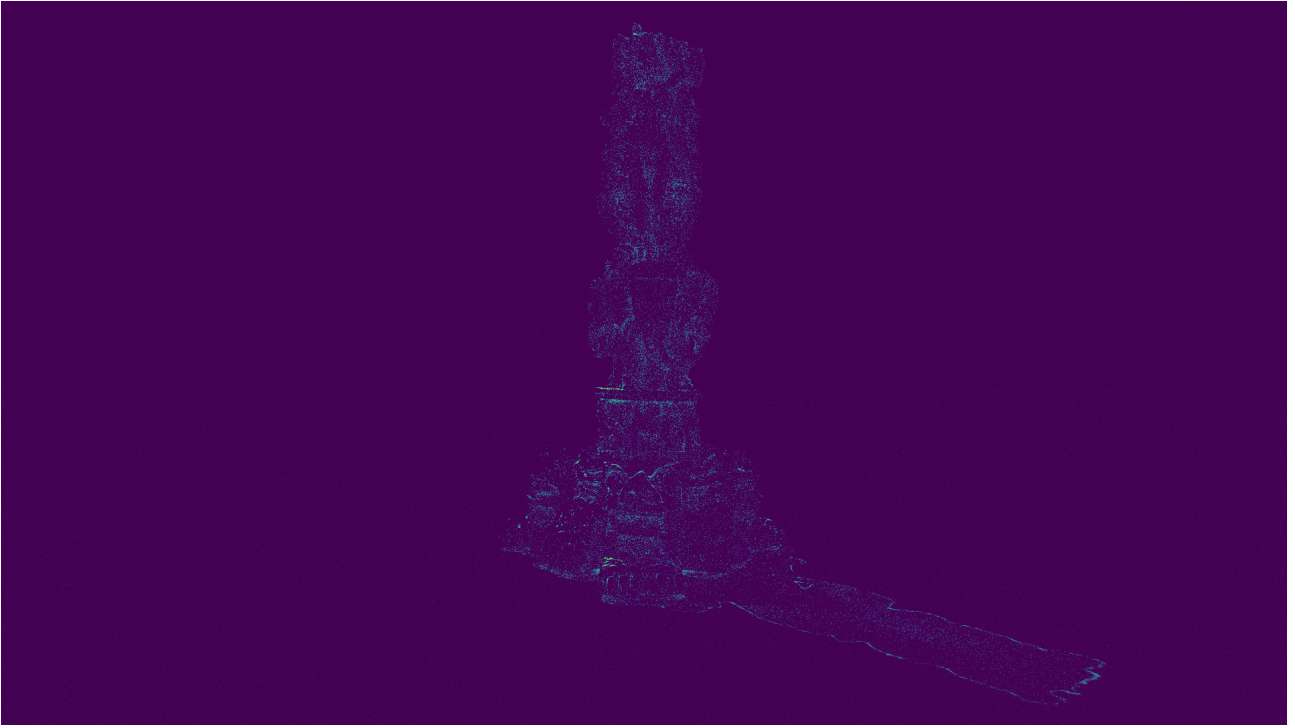


Figure 19: *Difference between Fig. 17 and Fig. 18 $\times 3$.*

1.8 THAI STATUE LOW

Fig. 20 - Fig. 22 show the rendered results of the THAI STATUE LOW scene. This scene contains 0.5M triangles and Fig. 1b is used for IBL.



Figure 20: *The THAI STATUE LOW scene rendered using NIF after 32 training spp.*



Figure 21: *The THAI STATUE LOW scene rendered using ray casting with BVH.*

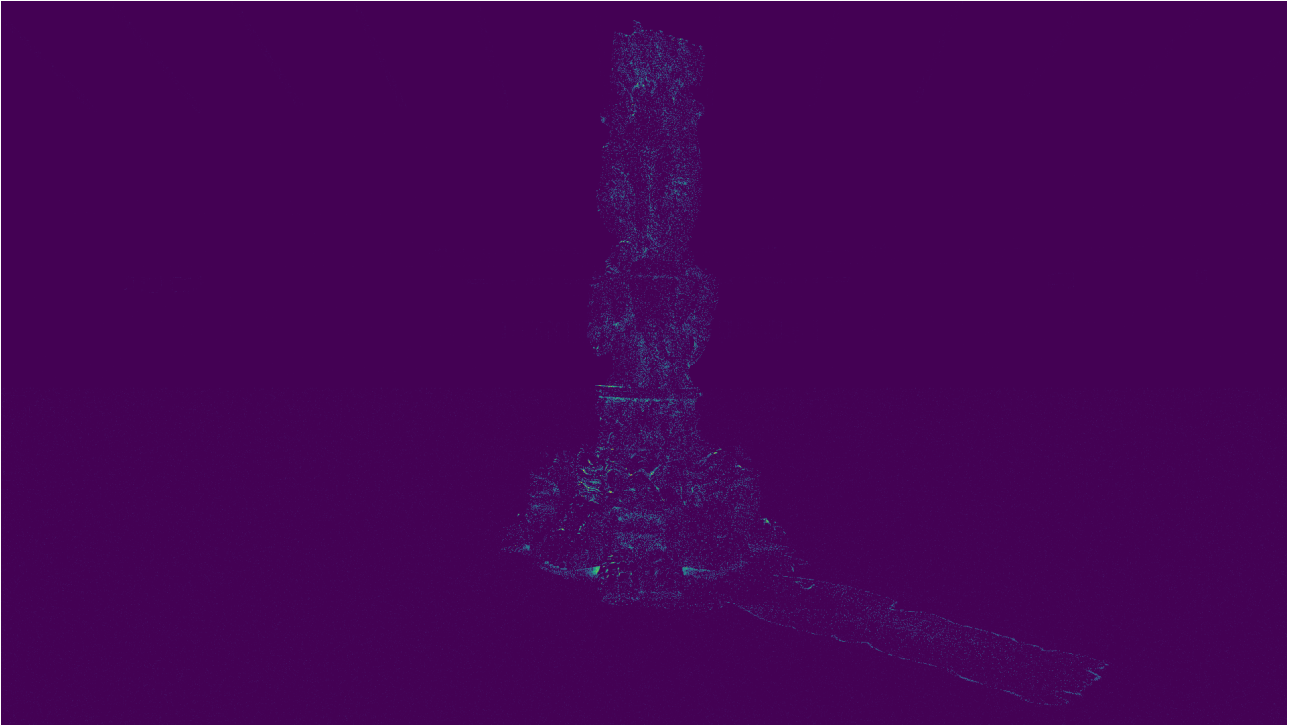


Figure 22: *Difference between Fig. 20 and Fig. 21 $\times 3$.*

1.9 THAI STATUES

Fig. 23 - Fig. 25 show the rendered results of the THAI STATUES scene. This scene contains 5 THAI STATUE models which result in 50M triangles in total. Fig. 1b is used for IBL.



Figure 23: *The THAI STATUES scene rendered using NIF after 32 training spp.*



Figure 24: *The THAI STATUES scene rendered using ray casting with BVH.*

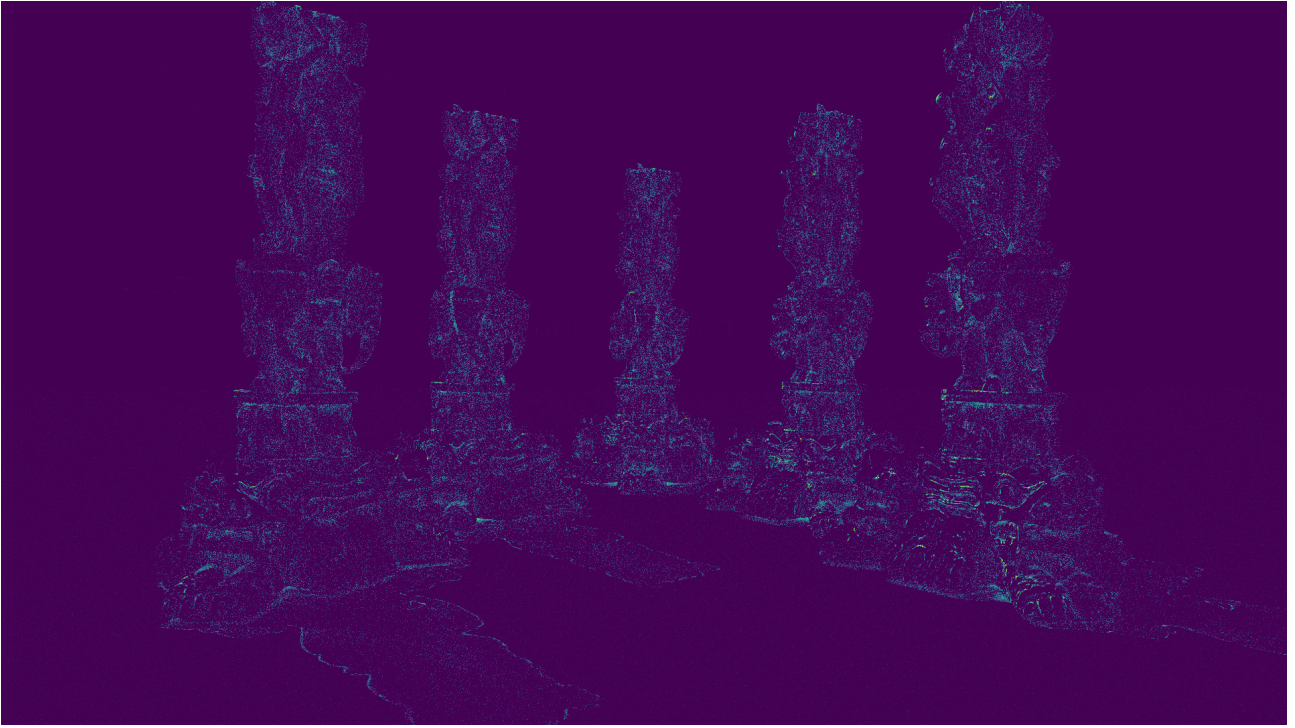


Figure 25: *Difference between Fig. 23 and Fig. 24 $\times 3$.*

1.10 STATUES A

Fig. 26 - Fig. 28 show the rendered results of the STATUES A scene. This scene contains 3 complex geometries which result in 17.5M triangles in total. Fig. 1b is used for IBL.



Figure 26: *The STATUES A scene rendered using NIF after 32 training spp.*



Figure 27: *The STATUES A scene rendered using ray casting with BVH.*



Figure 28: *Difference between Fig. 26 and Fig. 27 $\times 3$.*

1.11 STATUES B

Fig. 29 - Fig. 31 show the rendered results of the STATUES B scene. This scene contains 9 complex geometries which result in 52.8M triangles in total. Fig. 1b is used for IBL.



Figure 29: *The STATUES B scene rendered using NIF after 32 training spp.*



Figure 30: *The STATUES B scene rendered using ray casting with BVH.*

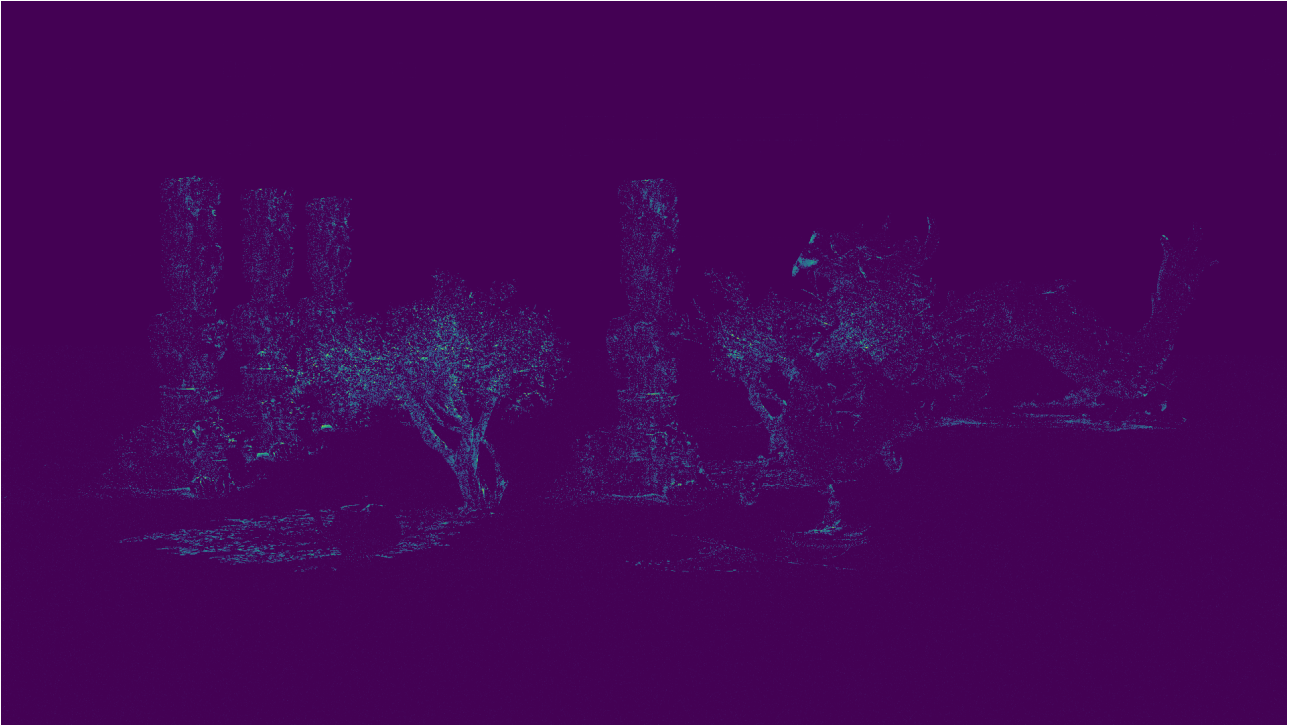


Figure 31: *Difference between Fig. 29 and Fig. 30 $\times 3$.*

Acknowledgments

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References

- [1] Amazon Lumberyard. Amazon lumberyard bistro, open research content archive (orca), July 2017.