Supplemental - Glossy Probe Reprojection for Interactive Global Illumination

SIMON RODRIGUEZ, Université Côte d'Azur and Inria
THOMAS LEIMKÜHLER, Université Côte d'Azur and Inria
SIDDHANT PRAKASH, Université Côte d'Azur and Inria
CHRIS WYMAN, NVIDIA Corporation
PETER SHIRLEY, NVIDIA Corporation
GEORGE DRETTAKIS, Université Côte d'Azur and Inria

ACM Reference Format:
Simon Rodriguez, Thomas Leimkühler, Siddhant Prakash, Chris Wyman, Peter Shirley, and George Drettakis. 2020. Supplemental - Glossy Probe Reprojection for Interactive Global Illumination. *ACM Trans. Graph.* 39, 6 (December 2020), 6 pages. https://doi.org/10.1145/3414685.3417823

In this supplemental document, we present error maps corresponding to fig. 16, 17 and 18 in the article, along with a qualitative comparison of different probe counts and resolution when rendering the *Bathroom* scene.

1 ERROR MAPS

In Fig. 1,2,3,4, we evaluate the accuracy of our method on the images presented in the main article. We display the per-channel squared difference between the offline path-traced ground truth generated with Mitsuba and our method. Values are scaled by 10 to improve visibility. We provide similar error maps for the real-time ray-tracing with lightmap baseline, as it is the one that had the closest error scores and is available on all our test scenes. Our method is able to more accurately render glossy reflections thanks to the fully precomputed lighting, where the baseline has difficulties sampling the area emitters properly. On the other hand our method exhibit errors on reflector edges, partially caused by specular aliasing.

2 VARYING PROBE COUNT AND RESOLUTION

We processed the *Bathroom* scene for 125, 252 and 504 probes, at resolutions 768x384, 1024x512 and 1440x720, doubling the probe texel count each time (see Fig. 5). Increasing the probe resolution improves details around object edges in reflections, for instance the reflection of the furniture in the wall mirror. At low probe count, coverage of glossy effects can become incomplete, as can be observed on the top of the bin for 125 probes. The corresponding ground truth rendering is visible in Fig. 7 and error maps in Fig. 6. In this case 252 probes is probably sufficient; minor quality degradation with 504 probes (e.g., side panel highlight) is probably because we do not test for intersections of the probes with geometry, which happens more often at higher probe counts.

Authors' addresses: Simon Rodriguez, Université Côte d'Azur and Inria, simon.rodriguez@inria.fr; Thomas Leimkühler, Université Côte d'Azur and Inria, thomas.leimkuhler@inria.fr; Siddhant Prakash, Université Côte d'Azur and Inria, siddhant.prakash@inria.fr; Chris Wyman, NVIDIA Corporation, cwyman@nvidia.com; Peter Shirley, NVIDIA Corporation, pshirley@nvidia.com; George Drettakis, Université Côte d'Azur and Inria, george.drettakis@inria.fr.

© 2020 Copyright held by the owner/author(s). Publication rights licensed to ACM.
This is the author's version of the work. It is posted here for your personal use. Not for redistribution. The definitive Version of Record was published in *ACM Transactions on Graphics*, https://doi.org/10.1145/3414685.3417823.

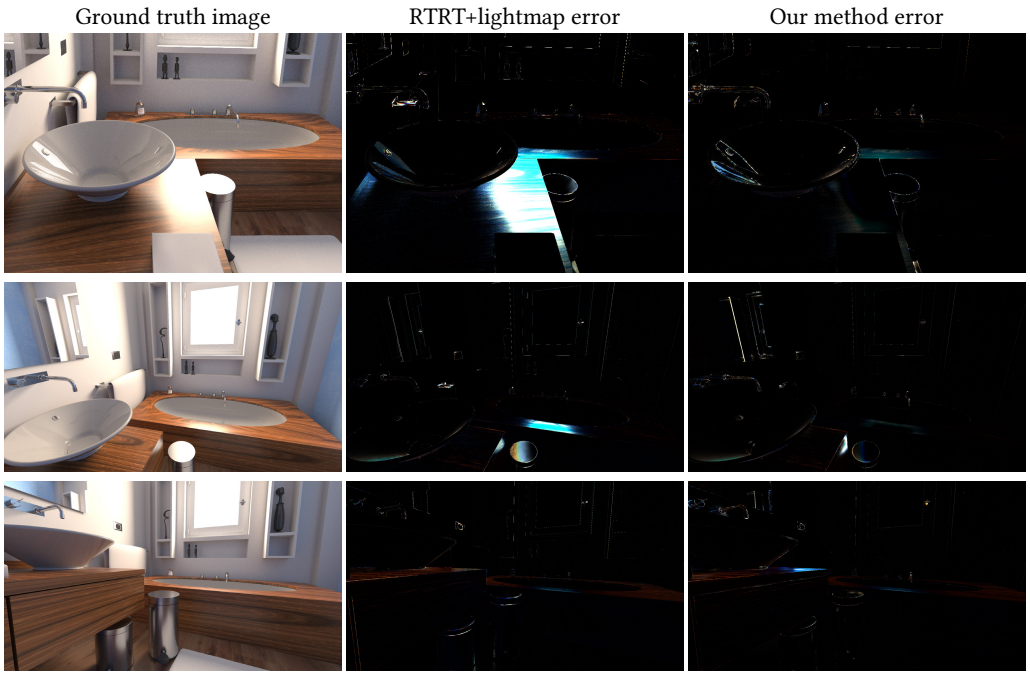

Fig. 1. Per-pixel square error on *Bathroom*, scaled 10x, for the RTRT + lightmap baseline and our method.

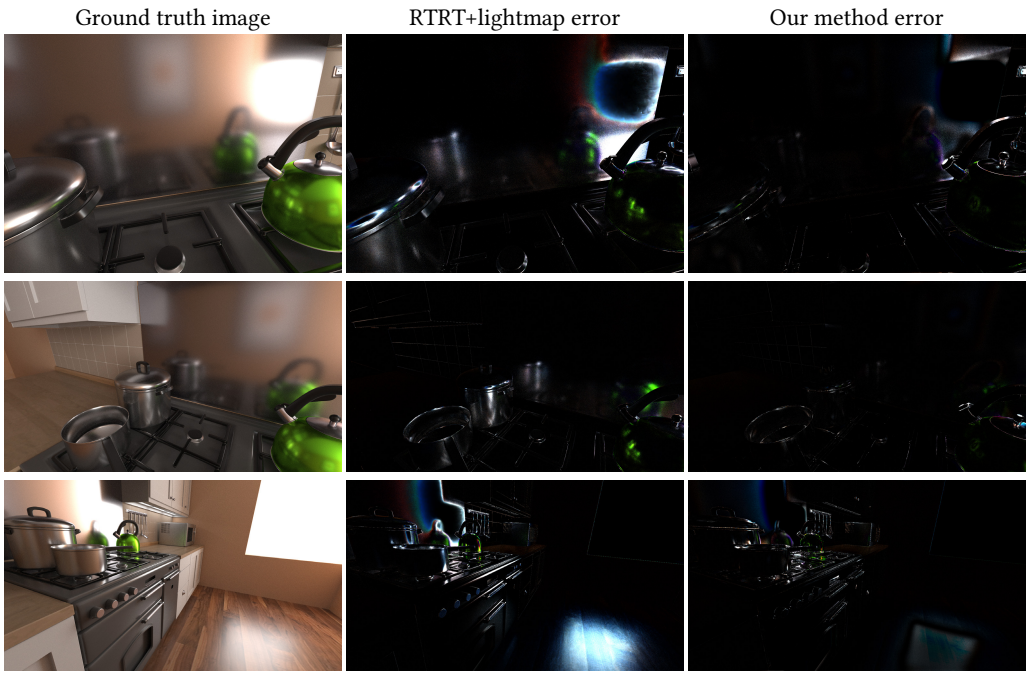

Fig. 2. Per-pixel square error on *Kitchen*, scaled 10x, for the RTRT + lightmap baseline and our method.

Fig. 3. Per-pixel square error on *Livingroom*, scaled 10x, for the RTRT + lightmap baseline and our method.

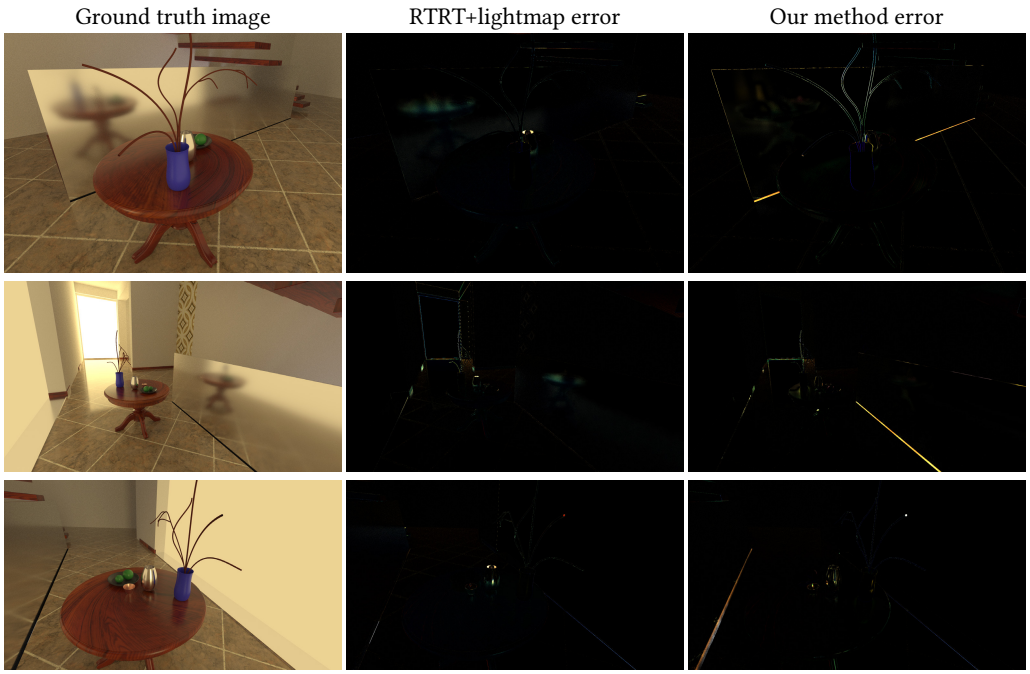

Fig. 4. Per-pixel square error on *Staircase*, scaled 10x, for the RTRT + lightmap baseline and our method.

Fig. 5. Rendering *Bathroom* using different probe count and resolution.

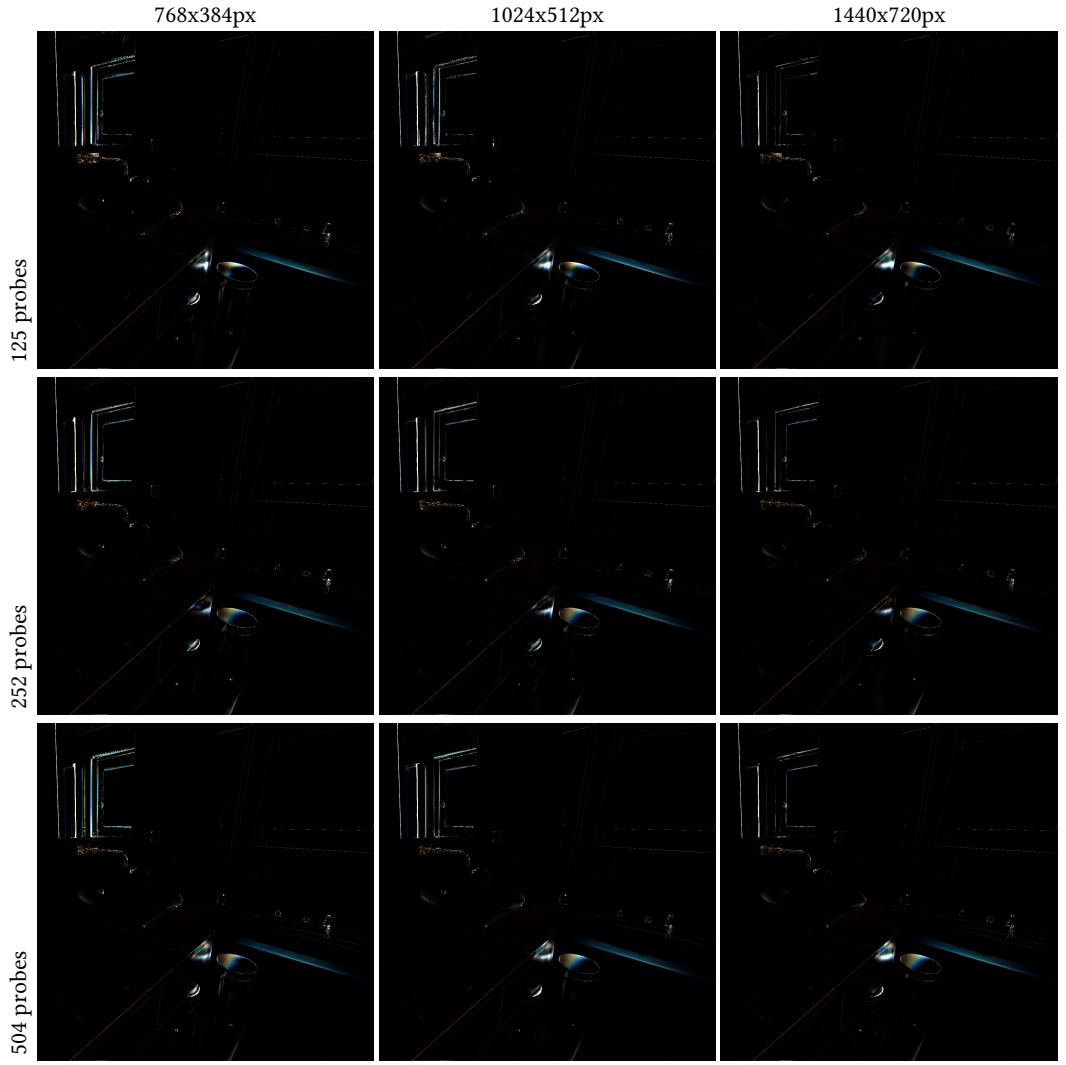

Fig. 6. Corresponding error maps (per-channel squared error, scaled 10x for visibility).

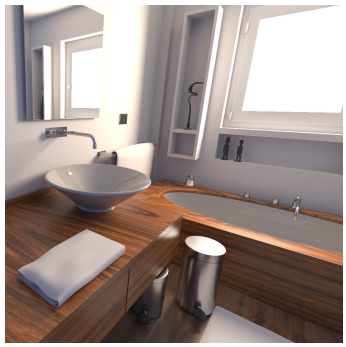

Fig. 7. Ground truth rendering of the same viewpoint.