Pacific Graphics 2020
E. Eisemann, A. Jacobson, and F.-L Zhang
(Guest Editors)

Volume 39 (2020), Number 7

Supplemental Document : Two-stage Resampling for Bidirectional Path Tracing with Multiple Light Sub-paths

1055

This supplemental document includes the equal-time comparisons between BPT, PCBPT, RISBPT and our method with $M(=M_2)=100$ in Fig. 1, and the equal-time (1 min and 10 min) renderings for various number of light sub-paths M_2 in Figs. 2 to 11. As shown in Figs. 2 and 5 (1 min renderings), artifacts due to caching can be seen for small $M_2 = 50, 100$ and scenes with difficult visibilities, though such artifacts can be eliminated for 10 min renderings in Figs. 7 and 10.

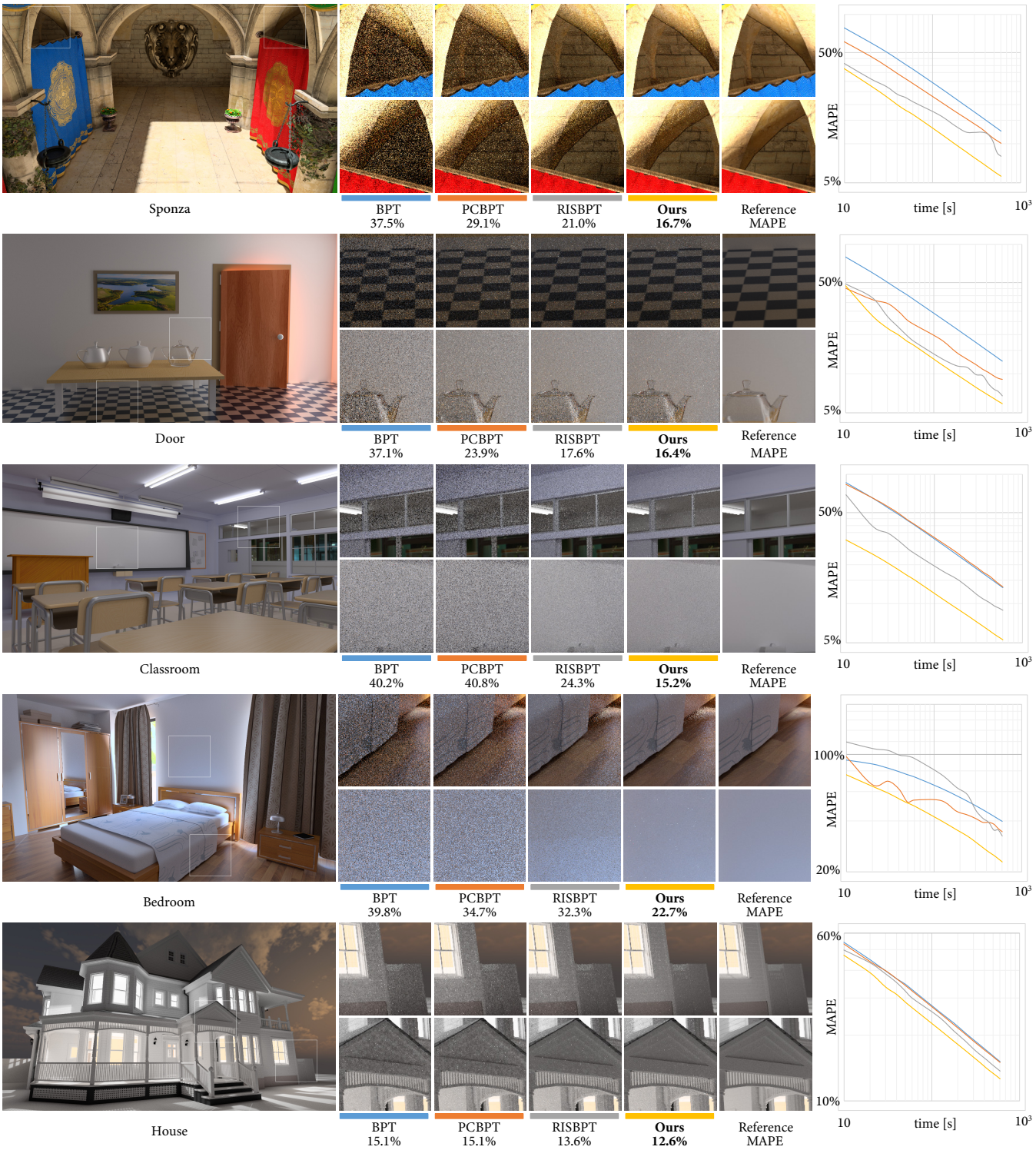

Figure 1: *Equal-time comparisons between BPT, PCBPT, RISBPT, and our method using* $M = 100$ *for PCBPT, RISBPT, and* $M_1 = 10^4, M_2 = 100$ *for our method. Bold entries indicate the lowest MAPEs among four BPT methods, and our method yields the lowest error in these scenes. The rightmost images show the convergence plots in log-log scale of four methods. As shown in the plots, RISBPT with* $M = 100$ *(gray colored plots) shows unstable noise reduction (Classroom and Bedroom) though it eventually converges, while our method (light orange colored plots) provides stable and better noise reduction due to the use of two orders of magnitude larger number of light sub-paths than PCBPT and RISBPT. Moreover, RISBPT can suffer from the light sub-path with extremely high contribution, resulting in bright images as shown in the floor of Door scene and the wall of Bedroom scene.*

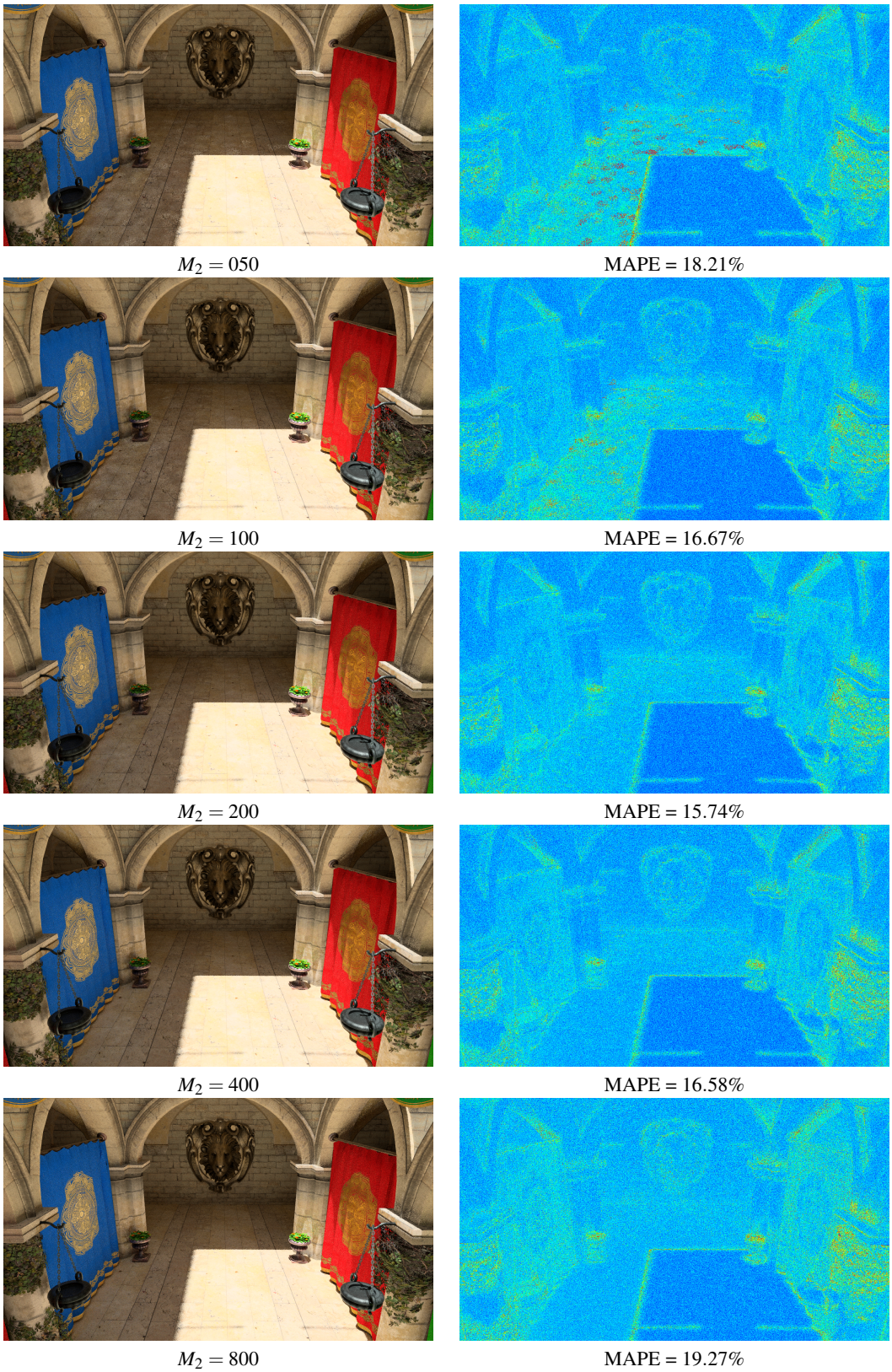

Figure 2: *Equal-time (1 min) renderings of Sponza scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

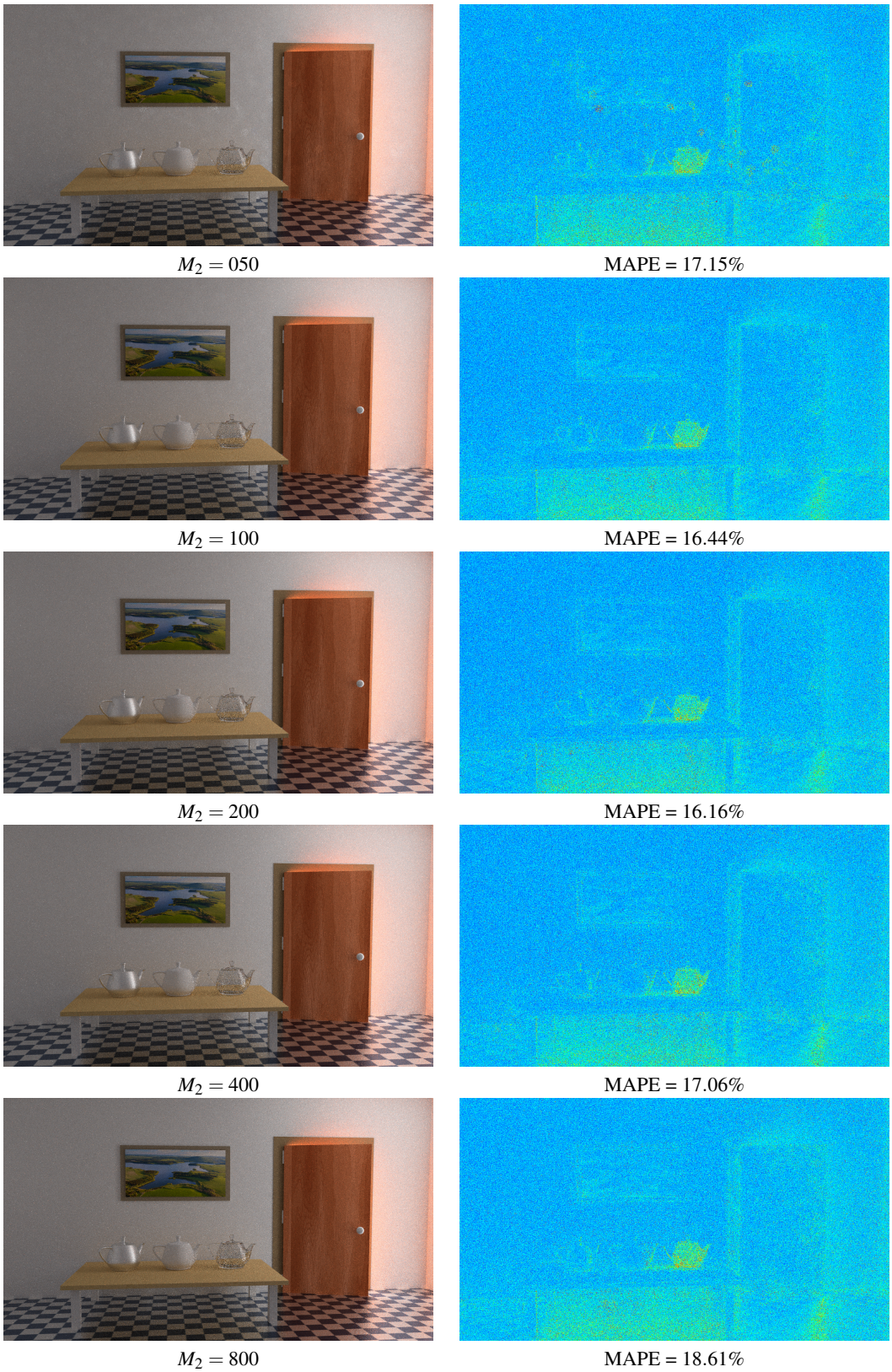

Figure 3: *Equal-time (1 min) renderings of Door scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

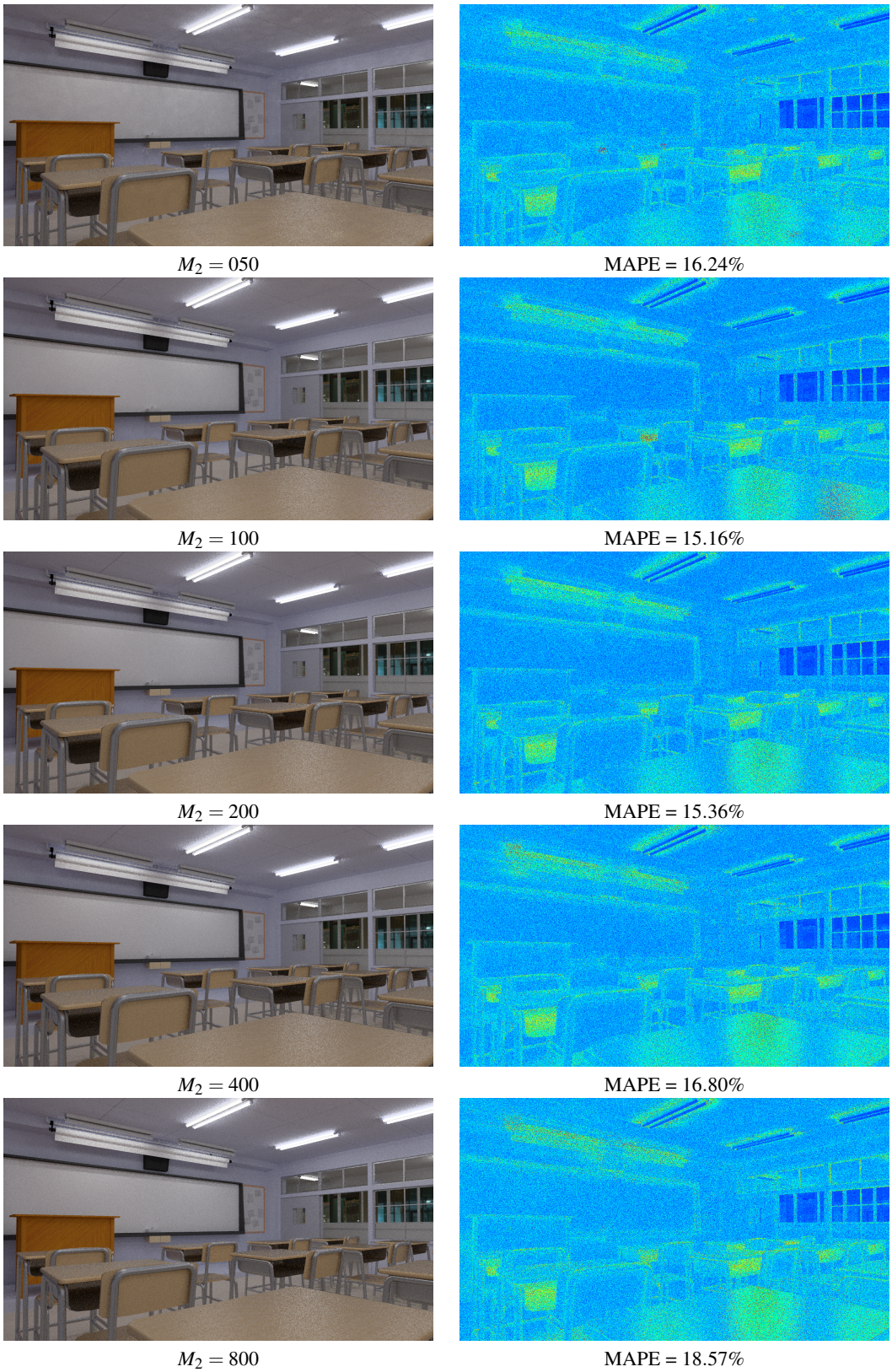

Figure 4: *Equal-time (1 min) renderings of Classroom scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

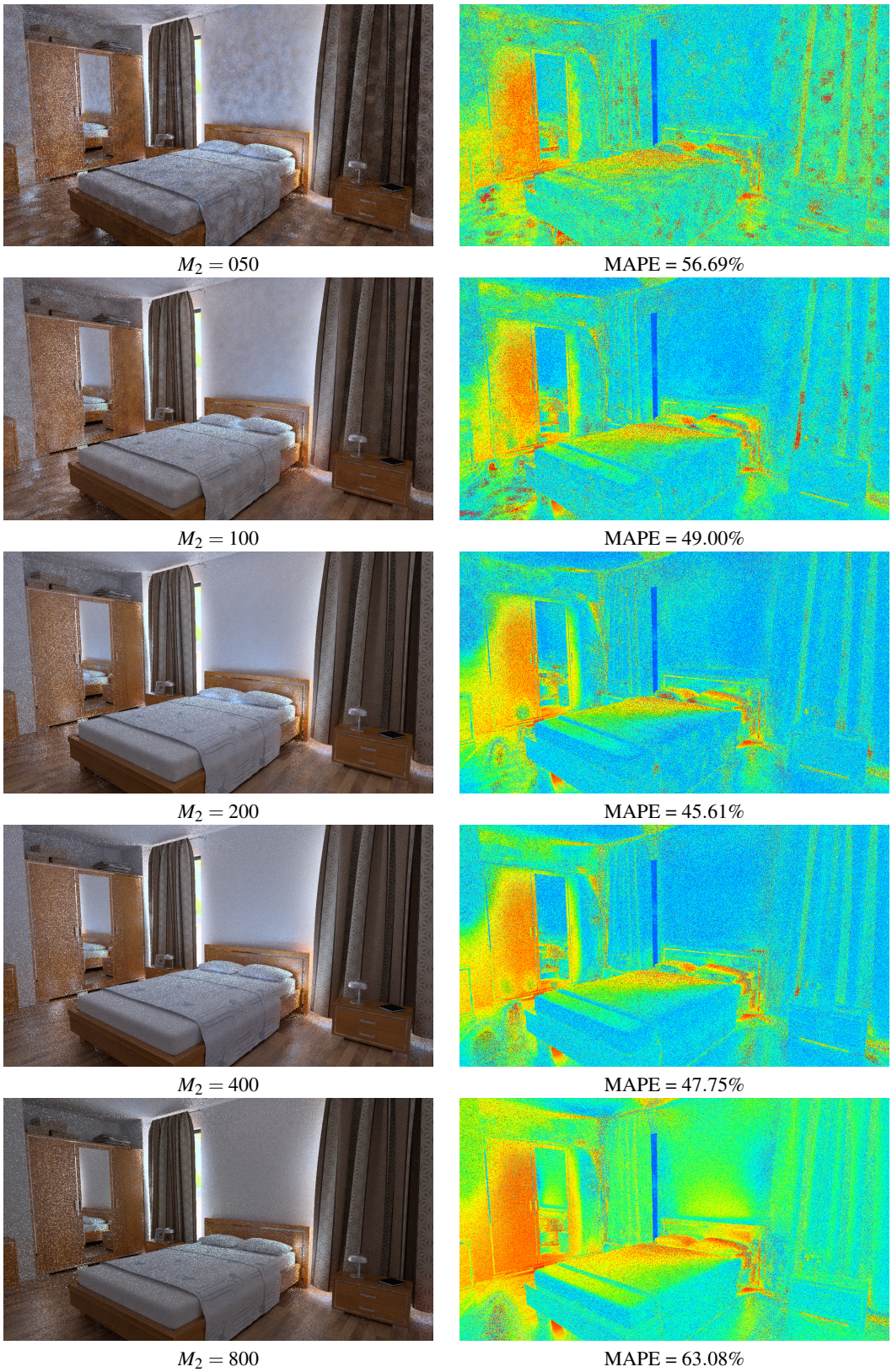

Figure 5: *Equal-time (1 min) renderings of Bedroom scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

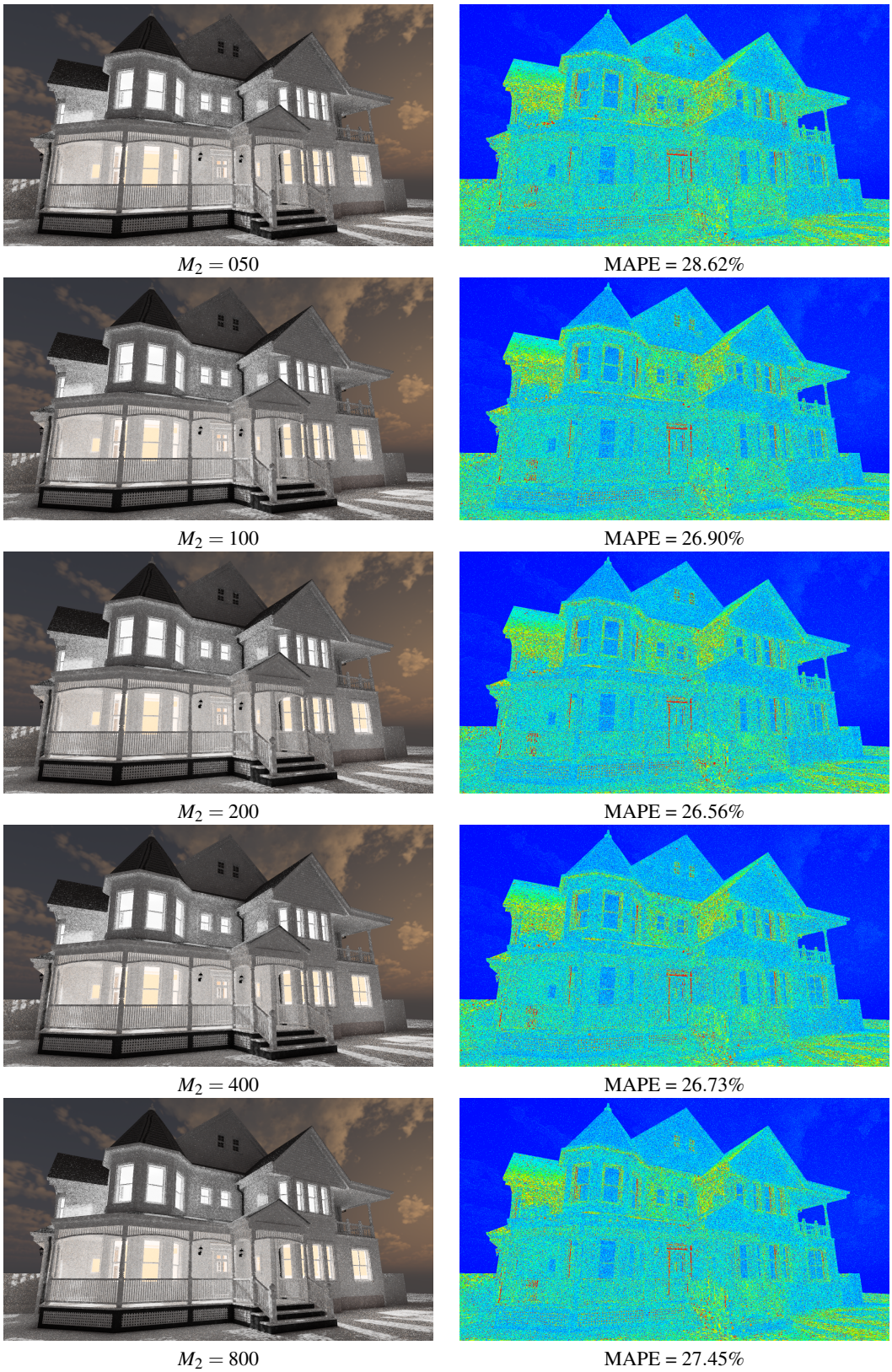

Figure 6: *Equal-time (1 min) renderings of House scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

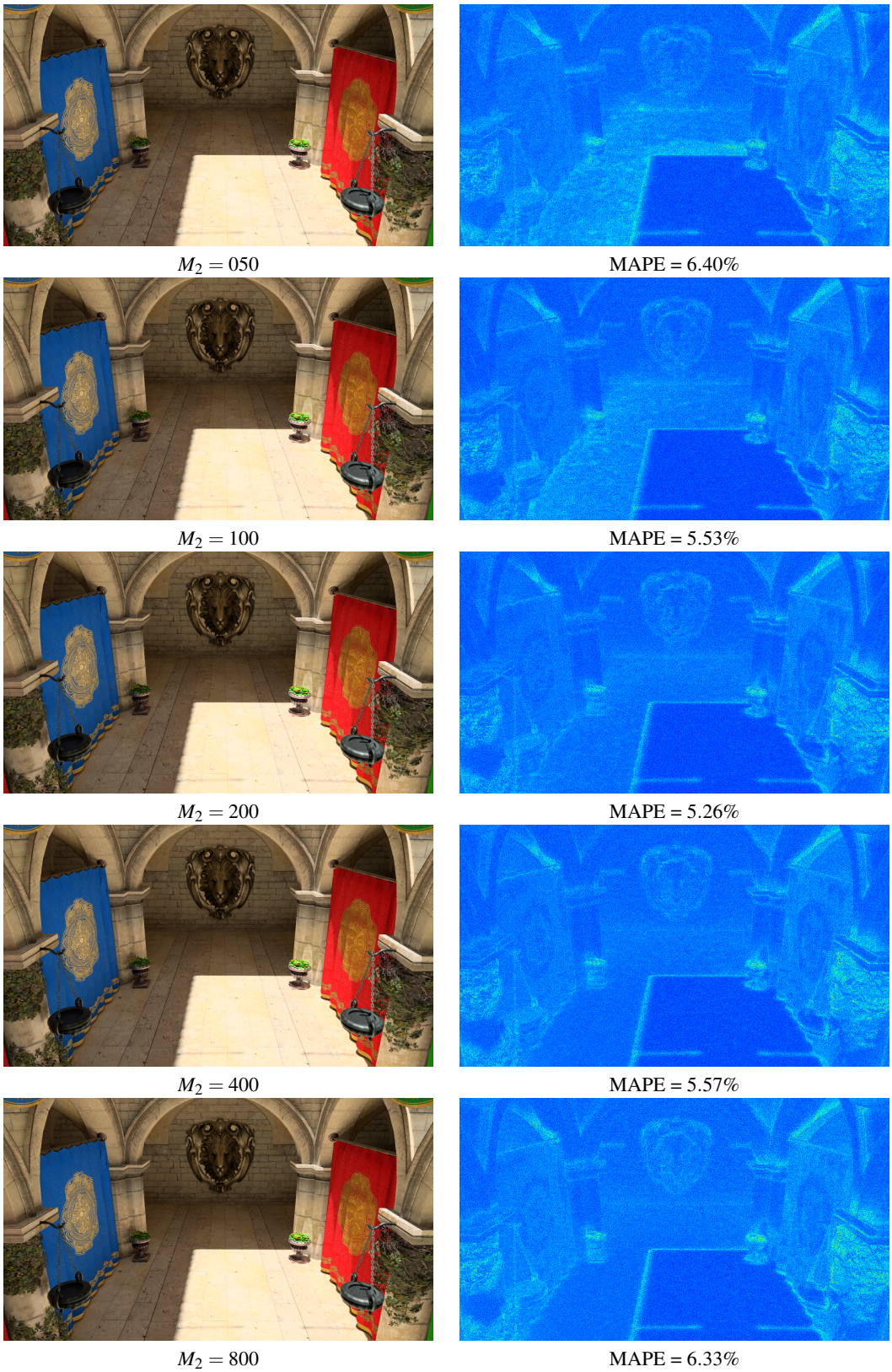

Figure 7: *Equal-time (10 min) renderings of Sponza scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

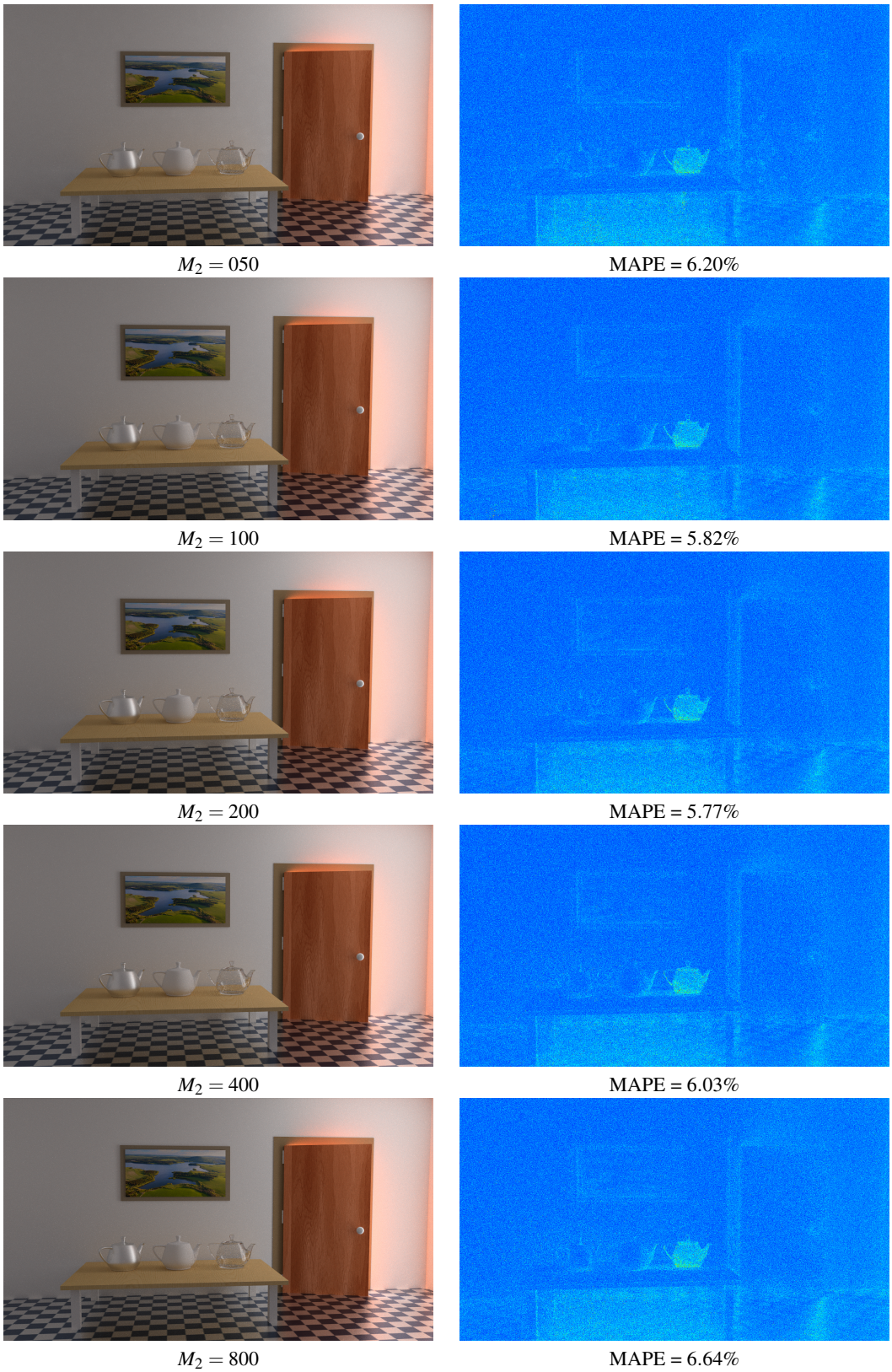

Figure 8: *Equal-time (10 min) renderings of Door scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

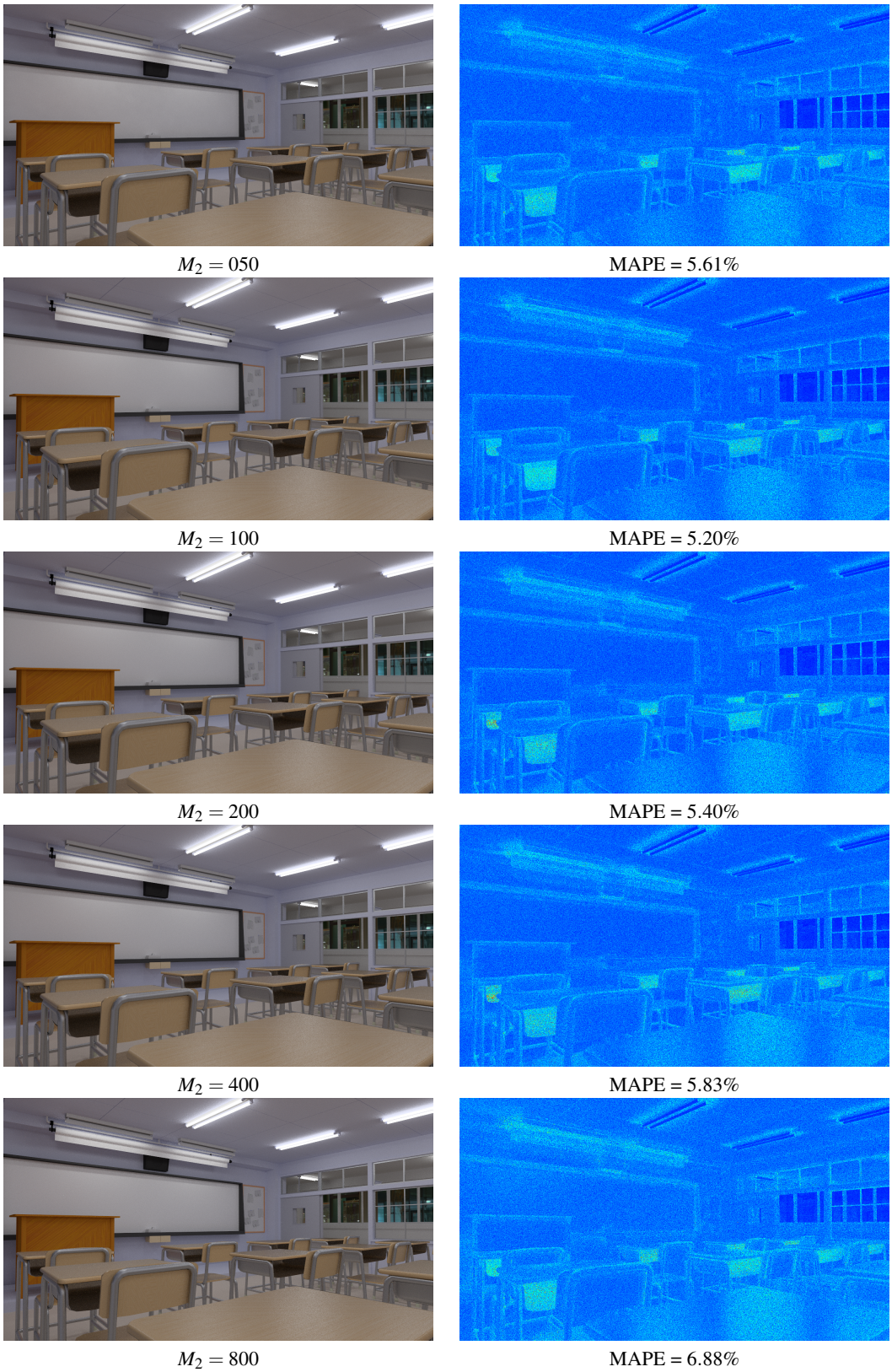

Figure 9: *Equal-time (10 min) renderings of Classroom scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

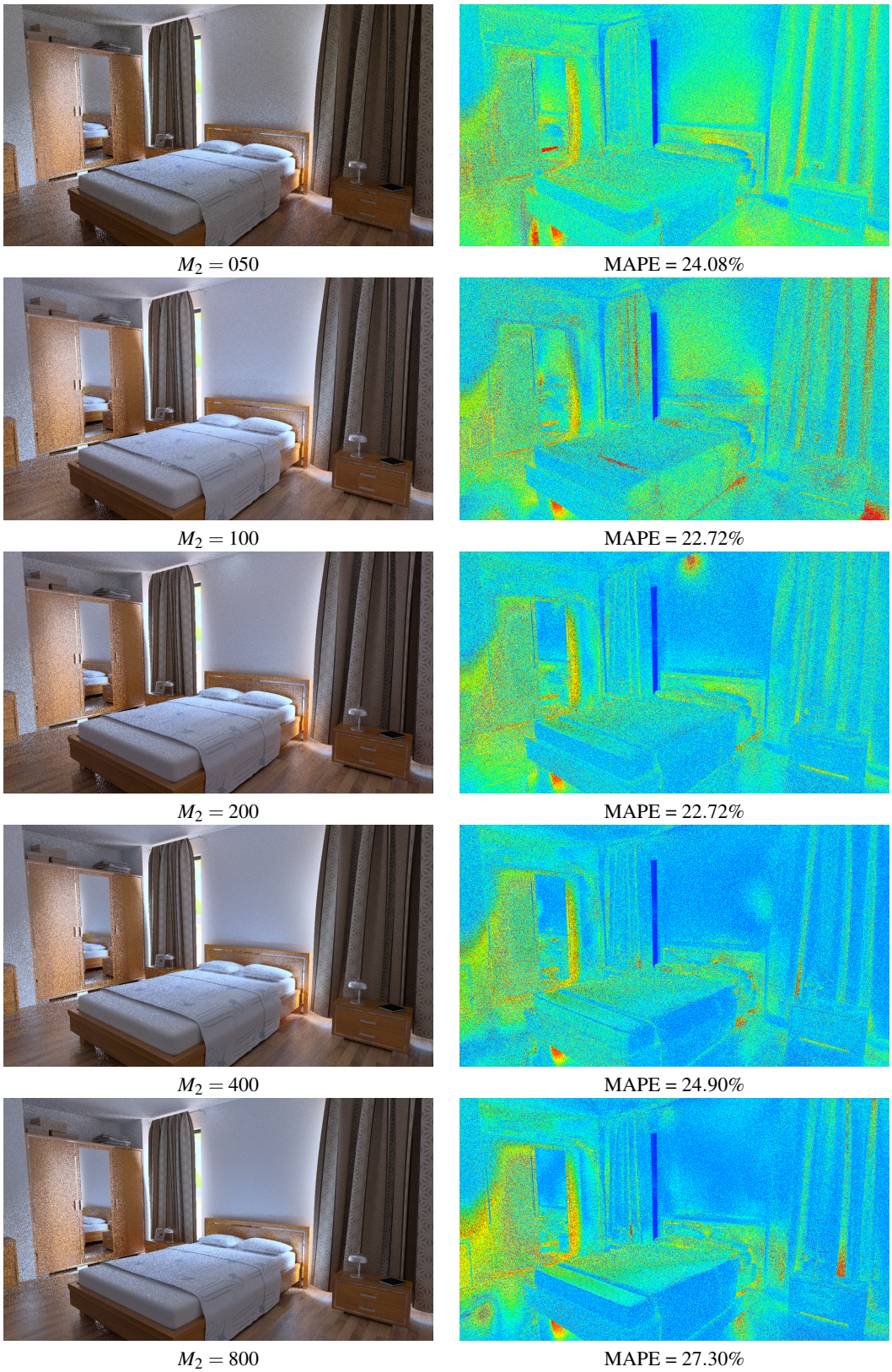

Figure 10: *Equal-time (10 min) renderings of Bedroom scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*

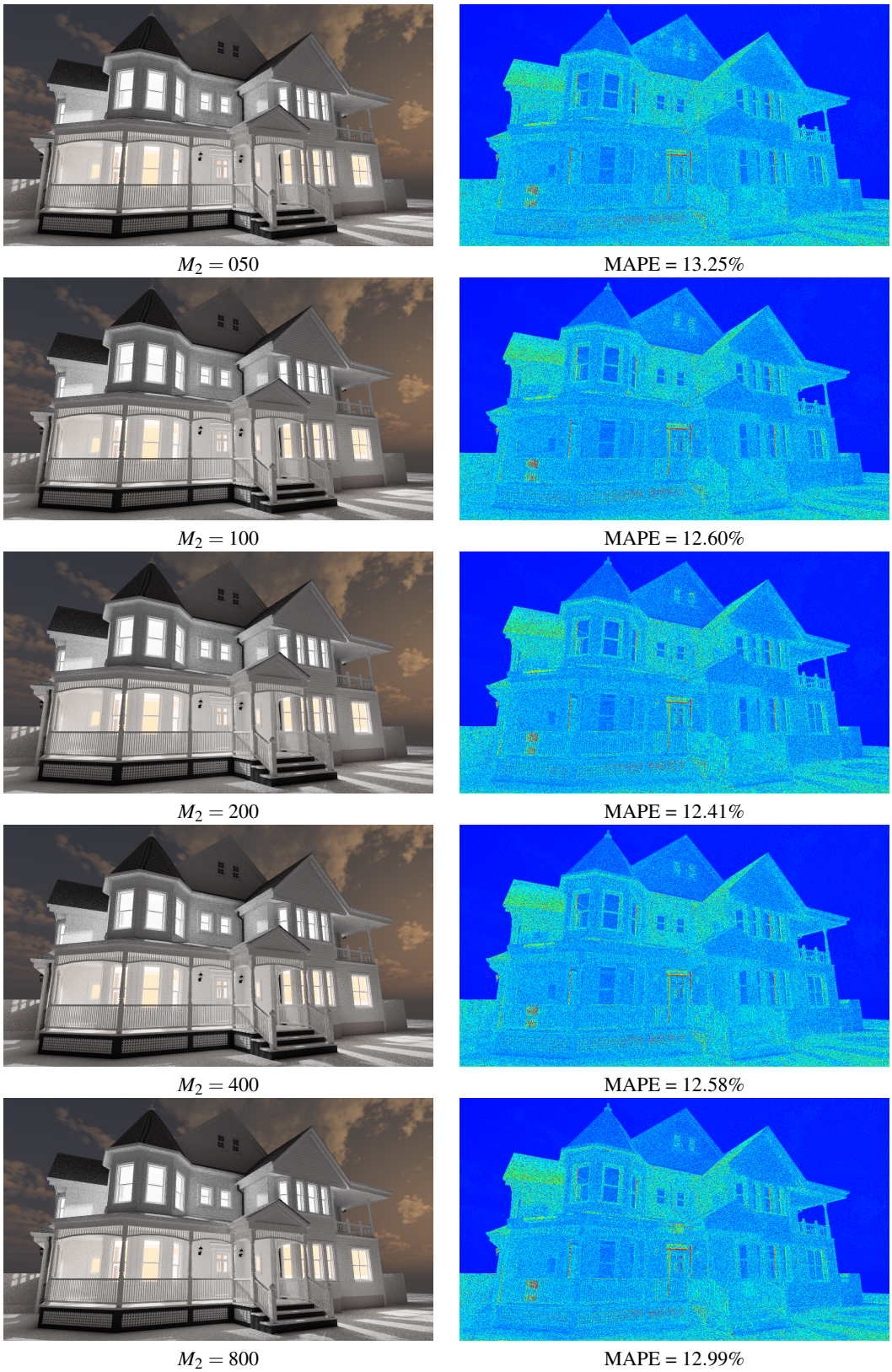

Figure 11: *Equal-time (10 min) renderings of House scene and error visualizations of our method using various M_2. The number of traced light sub-paths in the first-resampling-stage M_1 is fixed to 10^4.*