

Bidirectional Light Transport with Vertex Merging (supplemental material)

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Bidirectional path tracing (BDPT)



Progressive photon mapping (PPM)



Vertex merging (VM)



Vertex merging + bidirectional path tracing (VM+BDPT)

Figure 1: The SIGGRAPH Asia 2011 Souvenirs scene rendered with four different methods. Top left: This setup is problematic for bidirectional path tracing (BDPT) due to the presence of reflected and refracted caustics, which are sampled with low probabilities. Top right: The dominating diffuse illumination, on the other hand, exposes the lower order of convergence of progressive photon mapping (PPM). Bottom left: Vertex merging (VM) alone outperforms PPM, since unlike PPM it merges sub-paths at all vertices along the path, combining the estimates using multiple importance sampling (MIS). Bottom right: The new combined vertex merging and bidirectional path tracing (VM+BDPT) algorithm results in the lowest overall error, as it uses various path sampling techniques that MIS can adaptively mix, in order to extract the most salient information from the many resulting estimators.

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