Rasterized Bounding Volume Hierarchies

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Supplementary Material

In this supplementary material we provide the complete evaluation of the performance and quality of our Rasterized Bounding Volume Hierarchy (RBVH). Figure 1 shows seven models represented with different levels of approximation: from the finest (Q0) to the coarsest (Q4) (columns 2 - 6), and the reference rendering (column 1), which was obtained by ray tracing the triangle based BVH from [AL09]. All results were measured on an NVIDIA GTX 470. Figure 2 shows the quality and performance for secondary rays. Note that higher error due to the higher approximation is clearly visible in the reconstruction with primary rays (Figure 1), but it is hardly noticeable when tracing for secondary rays (Figure 2).

References

[AL09] AILA T., LAINE S.: Understanding the efficiency of ray traversal on GPUs. In *Proc. of High Performance Graphics* (2009), pp. 145–149. 1, 2, 3

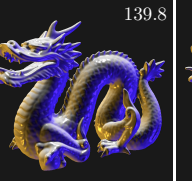**Figure 1:** *Quality and performance of individual RBVH configurations for tracing primary rays. All scenes, except for the Hand, have been constructed using the less restrictive projected surface area. ρ_s is the pixel-to-scene sampling density, from which we compute the pixel-to-area by simply dividing ρ_s by the area of the scene. α is the ratio of projected surface area to the total area, and φ is the opening angle of the cone of normals. The sampling density and the refinement criterion is shown in brackets next to the level of quality. The left most column consists of references ray traced using the BVH from [AL09]. Numbers in the corners report ray tracing performance in million rays per second.*
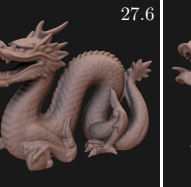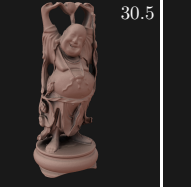
Figure 2: *Quality and performance of individual RBVH configurations for tracing secondary (diffuse) rays. All scenes, except for the Hand, have been constructed using the less restrictive projected surface area. ρ_s is the pixel-to-scene sampling density, from which we compute the pixel-to-area by simply dividing ρ_s by the area of the scene. α is the ratio of projected surface area to the total area, and φ is the opening angle of the cone of normals. The sampling density and the refinement criterion is shown in brackets next to the level of quality. The left most column contains references ray traced using the BVH from [AL09]. Numbers in the corners report ray tracing performance in million rays per second.*