function BuildMultiLevelHG(triangle[] T)
    V = BoundingBox(T)
    for all $i \in \{x, y, z\}$
        $M_i = \frac{\max(V_i)}{\min(V_i)} \times \sqrt{32 \times \text{length}(T)}$
    oldgrid = BuildOneLevelHG($M_i$, T, V)
    macrocells = BuildMacroCells(oldgrid, 6)
    return new mlgrid(oldgrid, macrocells)

Multi-level hashed grids behave especially well for the larger tested scenes, with the most empty cells, having around twice the render time performance of one-level hashed grids described by Lagae et al. These results are better than the 30% speedup for non-hashed grids reported by Wald et al.


In the left chart, acceleration structure build time statistics can be seen. At middle, the chart has render time statistics. At right are acceleration structure memory usage statistics for the tested scenes. Timings are the average of several test runs. All timings were done on a machine using a 3GHz Intel Core 2 Duo CPU. Only a single thread was employed. All images were rendered at a resolution of $1024 \times 1024$ with one ray per pixel and diffuse shading.

This work was supported by the Portuguese Foundation for Science and Technology project VIZIR.

(PTDC/EIA/66655/2006)