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A BVH traversal algorithm which is independent from models

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For many years, photorealistic rendering of computer graphics has been an important issue. Ray tracing is a basic technique of photorealistic rendering. Ray tracing has long been a method to use for off-line rendering, however it is often too slow for interactive systems. In recent years, ray tracing has reached the level of interactive use due to the development of computer technology, and the result of research into ray tracing algorithms.

This thesis aims for the improvement of the existing algorithm. BVH-based packet traversal is the method to speed up performance of ray tracing. However, the effect of the BVH-based packet traversal depends on size of the packet and 3D scenes. Therefore existing BVH-based packet traversal is not effective in every case, and ineffective in some case.

This thesis describes a method that works equally well in every case. Our method is concentrated on the hierarchy of rays. It enables culling of rays from a packet, while the packet traversing a node of BVH. That can get rid of dependence on 3D scenes.

As a result of this thesis, BVH-based packet traversal is possible to use effectively in every situation. Our BVH-based packet traversal provides even faster performance of ray tracing.