

**TITLE OF INVENTION: APPARATUS AND METHOD FOR PERFORMING
BOX QUERIES IN RAY TRAVERSAL HARDWARE**

ABSTRACT

Apparatus and method for box-box testing. For example, one embodiment of a processor comprises: a bounding volume hierarchy (BVH) generator to construct a BVH comprising a plurality of hierarchically arranged BVH nodes; traversal circuitry to traverse query boxes through the BVH, the traversal circuitry to read a BVH node from a top of a BVH node stack and to read a query box from a local storage or memory, the traversal circuitry further comprising: box-box testing circuitry and/or logic to compare maximum and minimum X, Y, and Z coordinates of the BVH node and the query box and to generate an overlap indication if overlap is detected for each of the X, Y, and Z dimensions; distance determination circuitry and/or logic to generate a distance value representing an extent of overlap between the BVH node and the query box; and sorting circuitry and/or logic to sort the BVH node within a set of one or more additional BVH nodes based on the distance value.

Fig. 1