**Bounding volume hierarchies for collision detection**

Abstract

Performing intersection test between objects enclosed by bounding volumes can increase the performance of Virtual Environment applications. Ericson, (2005) stated that “although the test themselves have been simplified, the same number of pair wise tests are still being performed”. Thus, this is the reason why some researchers decided to utilize bounding volume hierarchies in order to reduce the number of pair wise test. Bounding volume hierarchies (BVHs) provide one of the common solutions to detect interference between objects. It can be represented as a tree structure comprising a root node and its child nodes. BVH is easy to implement and can be used in different types of queries; for example to trace intersection for ray tracing and collision detection application. There are a few factors that need to be considered when dealing with BVH. Designing hierarchy tree requires several considerations. Some of them are type of bounding volumes, shape, geometric model to be used, the structure of the hierarchy (binary, quad, or etc), a balanced tree hierarchy, the traversal techniques and others. In short, there are some trade-offs and further considerations that need to be taken into account before the creation of BVH.