Reviewer: Evan

Reviewee: Jun

Code Review II

1) What sort of visual debugging tools are in place?

Can draw the bounding boxes of all the objects

Can select the different objects in the scene

Can draw the broad phase structure

Recursively builds a list of aabbs to draw.

2) What other debugging tools are in place?

No non-visual debugging tools. Planning on drawing the oct tree node structure in imgui – logging construction to a txt file.

3) Which broad-phase techniques are used? Please describe in detail.

Using an octree for the broad phase. Octree has a min, max position. Initializes tree with an object list. Update octree during object update and physics update. Collision pairs to make sure things don’t collide twice. Contact list being generated but not being consumed (will be in narrow phase).

Octree has an insertion queue. When a new object is inserted, it is added to the queue and the tree will grab objects from the queue. Has an AABB to represent the region of the octree. Has a pointer to parent and pointers to the 8 children. Has a bitmask of active children. Has a lifetime to let empty nodes live in case they get reused.

Build tree: Single object won’t split the nodes. Find enclosing nodes. Creates a subdivision of the existing node into 8 nodes. Iterate through objects and check if it is enclosed within a child tree. Does recursive construction until all nodes have only 1 object. If node is empty, it is added to delete queue. At end of construction empty nodes are removed.

Update tree: Check insertion queue. If object to insert, do similar process to build tree to make new objects fit in the tree. If a node is empty for too long, it will be removed during update. Go through moved objects and see if it still is contained in the same node. Otherwise, go up into parent object.

4) Listen and understand current top problems.

Is not properly handling rotated objects in the octree.

Debugging is not visual

5) Examine code to look for solutions to current problems as well as efficiency,

effectiveness, and good coding practices .

Using efficient XMVector class for vector operations. Additionally, using bitmask to determine which nodes of the Octree are active. Using least recently used algorithm, for cleaning up empty nodes. Code was formatted well and was easy to navigate.

6) What did you learn from reviewing this code?

I learned a lot about the structure of Octrees. I wouldn’t have thought to use a bitmask to determine which nodes are active. Additionally, an Octree is nice for updating as you just move the object up the tree / into siblings as opposed to completely removing and reinserting.