GPU Acceleration Structure Library

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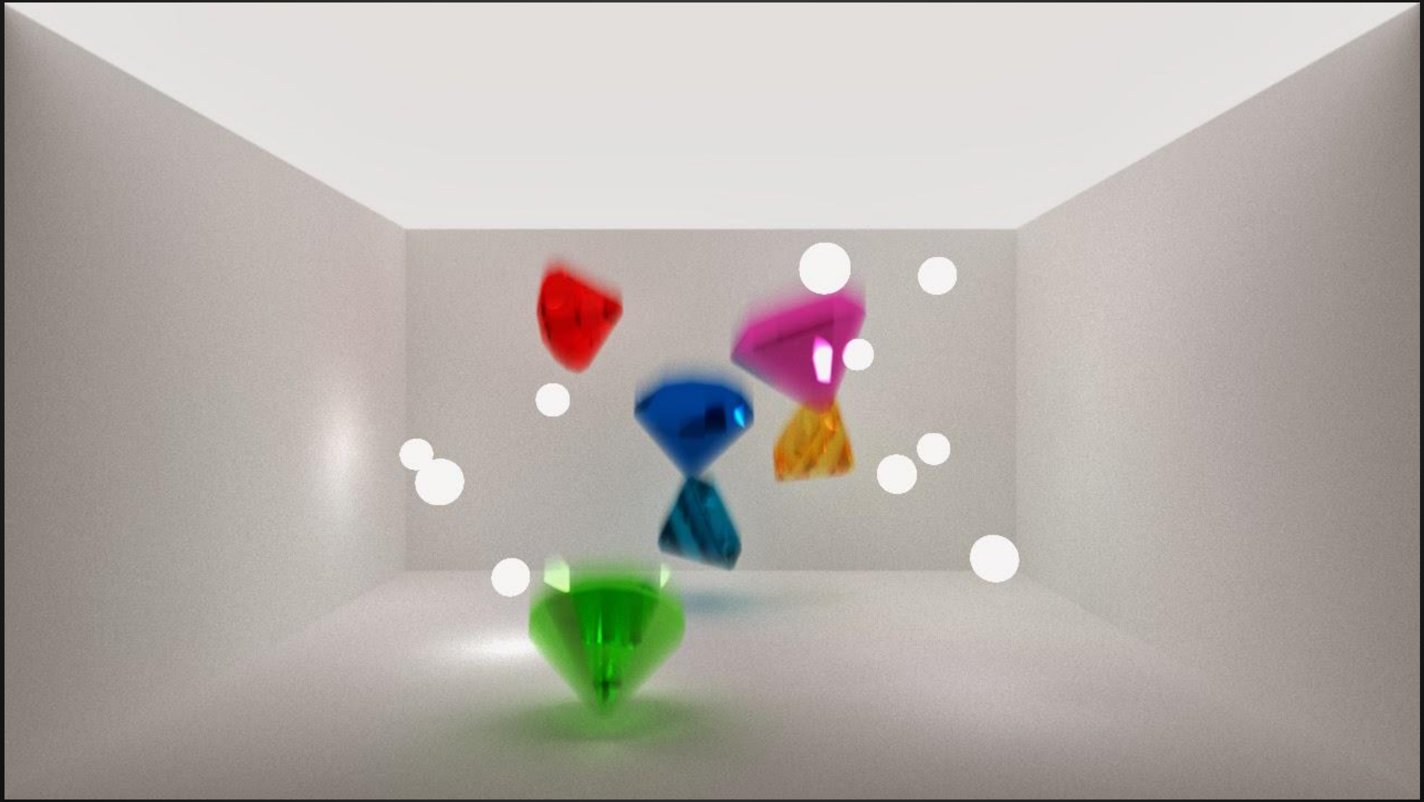
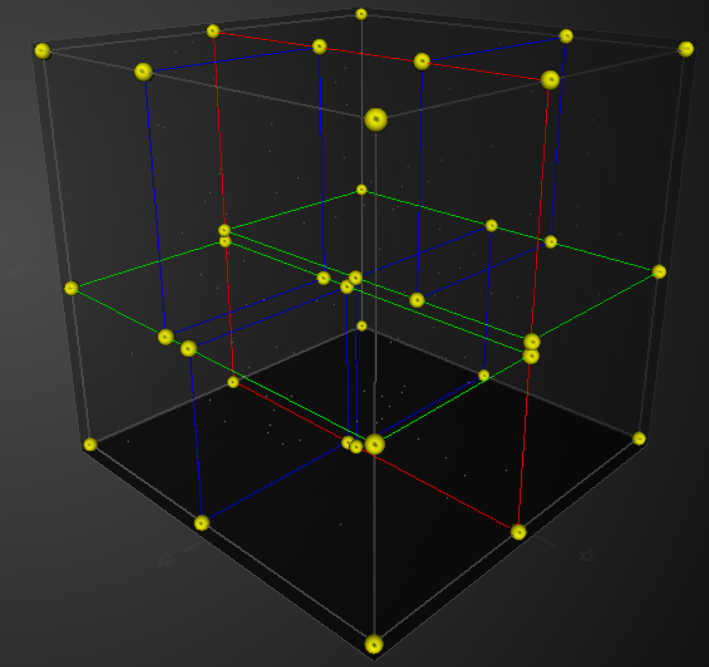
Motivation



Motivation

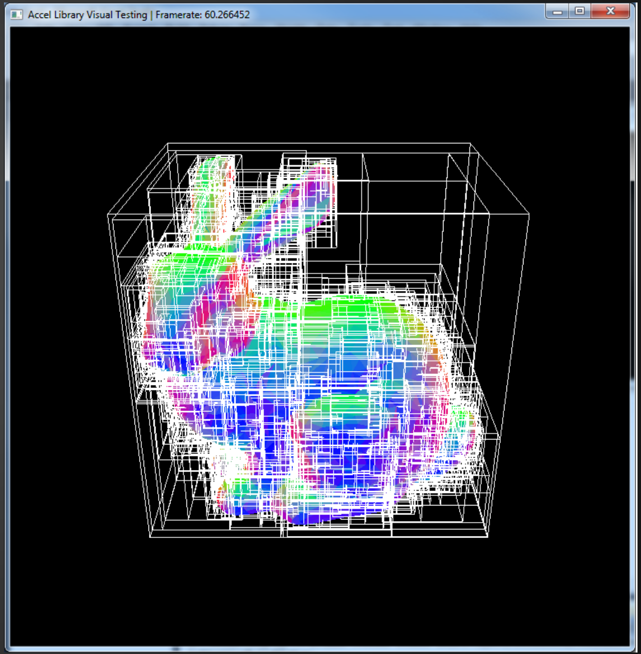
KD Trees

In its simplest form, can be thought of as an oct tree.



Prelim results

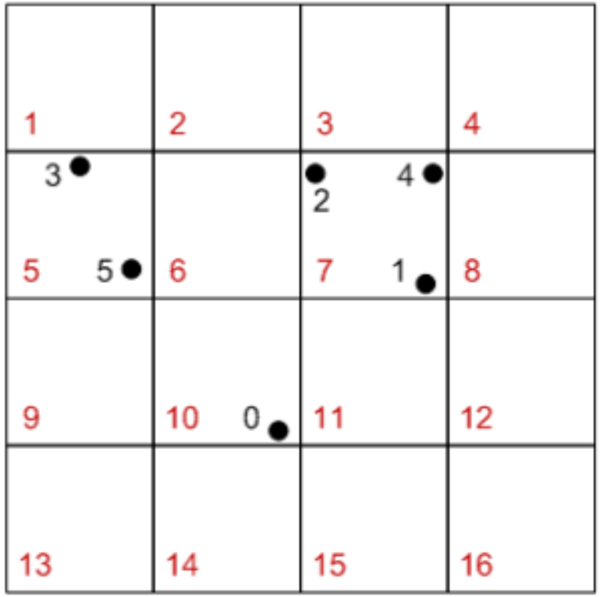
CPU construction



Spatial Hashing

Useful for nearest neighbor search

Algorithm basics



Unsorted List
(Cell ID, Photon ID)
(10, 0)
(7, 1)
(7, 2)
(5, 3)
(7, 4)
(5, 5)

→

List sorted by Cell ID
(5, 3)
(5, 5)
(7, 1)
(7, 2)
(7, 4)
(10, 0)

Hash Cell	Start Index
1	
2	
3	
4	
5	0
6	
7	2
8	
9	
10	5
11	
12	
13	
14	
15	
16	

Current API

```
hash_grid(int numParticles, glm::vec3* points,
glm::vec3 gridSize);

void findNeighbors(int maxNeighbors, float h);
```

Demo