Final Project Proposal

Members

Andrew Dunn, Alec Jackson

Project Manager

Andrew Dunn

Final Deliverable

Acceleration and other improvements to the ray tracer. The final deliverable of the project will be a ray tracer with reduced render time, possibly capable of real-time rendering of animated scenes. The primary speedup is intended to come from the use of acceleration structures, however we may also use other optimization techniques alongside acceleration structures to further decrease render time, such as Level Of Detail algorithms (as mentioned in setion 25.3 of *Fundamentals of Computer Graphics*).

Milestone 1

For milestone 1 we plan to have the primary acceleration technique of BVH implemented with noticeable speedups and the side effects to be within expectations. At this stage we may have implemented more smaller optimizations to more efficiently ray trace without the need for major fine tuning. We may have excessive memory usage to get into feasible bounds, however. Additionally, since these techniques have their own drawbacks, from missing scene elements to increased memory usage, we will have established realistic hardware limits for our implementation.

Milestone 2

For milestone 2 we plan to have researched and selected an algorithm (possibly several to experiment with) that will achieve the LOD thinning that we plan to achieve. We will also begin the implementation of said algorithm, but that may take longer than 1 week to have LOD implemented at a functional level.

Roadmap

Monday March 1

-- Implementation of bounding volume (setup for acceleration structures)

– Initial research on LOD algorithms with proposed set of potential algorithms

Monday March 5

-- Complete research and select algorithm(s) for LOD mesh thinning

-- Begin implementation of selected algorithm(s)

Monday March 15

-- Polished implementation

-- Comparison analysis between speed and potential trade-offs of tuneable parameters