

Final Project Proposal

Members

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Project Manager

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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 section 25.3 of *Fundamentals of Computer Graphics*).

Milestone 1

For milestone 1 we will have selected the approach we will use for acceleration, most commonly BVH or grids, however several other approaches exist. At this point we will have decided on both the approach and how to implement it into the existing Julia raytracer as well as estimating what kind of rendering improvement we will be able to achieve with this technique. Additionally, since all of these techniques have their own drawbacks, from missing scene elements to increased memory usage we will have established what we expect the final result to be.

Milestone 2

For milestone 2 we plan to have the primary acceleration technique(s) implemented with noticeable speedups and the side effects to be within expectations. At this stage we may have implemented one or more techniques without the fine tuning needed to have a cohesive ray tracer depending on the approach used, or we may have excessive memory usage to get into feasible bounds. The remaining week will be used to polish this into a usable state.

Roadmap

Monday February 22

-- Agreement on approach used and integration into existing ray tracer

Friday February 26

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

Friday March 5

-- Initial implementation of acceleration technique(s)

Monday March 15

-- Polished implementation with compromise between speed and potential tradeoffs