Project1 Specification
Brian Budge
April 20, 2004

1 Write a photon tracer

The goal of this assignment is to write a photon tracer. This will consist of the following:

**photon map** This phase should be trivial to implement since I’ve provided most of the code.

**ray tracer** You’ll need a ray tracer to do the final rendering. I’ve provided some of the code. You can do all lighting calculation using the photon map, or just the indirect lighting if you choose - implement both if you want.

**photon trace** This is the Monte Carlo simulation of the photons leaving light sources and being stored in the photon map.

2 Implement intersection acceleration

Write a bounding volume heirarchy, kd-tree, bsp-tree, octree, uniform grid, or any other acceleration structure you want. The easiest in my estimation is the bvh. There is code for the uniform grid in Shirley’s book. If you want to look at my copy of Matt Pharr’s book, there’s a kd-tree implementation in there.

I would test this on a basic ray tracer first, and then stick it in the photon tracing phase too.
3 Interface with the class “parser”

We’d all like to be able to use the same scenes. We’ll have a version of the spec out very soon, and code soon after that. We’ll have an example of how to interface to it. Then you can use it.

4 Minimal rendering requirements

The renderer must be able to render the cornell box scene that is on the class webpage. This can be compared to the images on http://www.graphics.cornell.edu/online/box/compare.html. It’s extra credit to get your light source oriented like the one on the webpage.

Additionally, you must render a scene with at least 100,000 primitives in it. This can be any scene you choose. If you want, you can collaborate on a model.

5 Handin information

Please create a webpage for this class. You will put images and relevant information such as rendering times and primitive counts. Also you should have a short discussion about your acceleration structure, and your renderer’s design.

Please email me the url of your page so that I can update the course webpage.

This is due April 29th at 11:00 AM.