CS500 Project: A Ray Tracer

Jon Sanchez

1 Objective

The goal of this project is to build a ray tracer.

2 Milestones

The project is broken up into several milestones. Those milestones will be added as they are completed.

2.1 Milestone 1

As part of the first milestone, you are to implement a very simple ray tracing program (ray casting really) with the following minimum requirements.

- Parse scene files in the provided format
- It has one camera specified by position, orientation and focal length.
- The resolution of the image must be configurable (both width and height) throw command line arguments.
- Sphere primitive should be supported.
- The program must generate a ray per pixel of your image.
- These rays should compute the intersection with a potential first hit.
- The color of the surface of the object intersected by a ray will be computed using the simplest illumination model by applying the material color multiplied by the ambient color.
- Generated image needs to be preview on a window while rendering and exported to a valid image format (bmp, png, jpeg).

3 Scene file

Data that needs to be read from the scene file is listed below:

- SPHERE <center position> <radius>
- DIFFUSE <material color>
- AMBIENT <ambient color>
- CAMERA <camera position> <target position> <up vector> <focal length>

4 Grading

Feature	Grade
Scene parsing	5%
Camera	20%
Adjustable resolution	10%
Sphere intersection	30%
Ray generation	10%
Material color	5%
Image export	5%
Preview window	15%