**CMSC 23700** **Introduction to Computer Graphics** **Project 1a**
**Fall 2004** **October 14**

# Ray tracer (Part a)

**Due: October 25**

As with Project 0, we will create a module in your course CVS repository on the Computer Science CVS server. The module is named `project-1` and contains the implementation of a GML interpreter. For Part-a of the project, you are responsible for the following GML operations:

| Name | Description |
|---|---|
| `light` | defines a directional light source |
| `plane` | the $XZ$-plane |
| `pointlight` | defines a point-light source |
| `render` | render a scene to a file |
| `rotatex` | rotation around the $X$-axis |
| `rotatey` | rotation around the $Y$-axis |
| `rotatez` | rotation around the $Z$-axis |
| `scale` | scaling transform |
| `sphere` | a unit sphere |
| `translate` | translation transform |
| `union` | union of two solids |
| `uscale` | uniform scaling transform |

See Handout 3 (Project 1 Overview) for details on these operations.

Note that while you do not have to implement the CSG intersection and difference operations in this stage, you should be mindful of their existence.

Your task is to complete this interpreter by adding the implementation of the graphics operations. You should use this module to hold the source for your project. We will collect the projects at 9pm on Monday October 25th from the repositories, so make sure that you have committed your final version before then.

The Makefile in the repository builds an executable program called `gml`. To raytrace a given GML file, we call this program with the filename as a command-line argument. For example, assume we have a GML file `scene.gml`, then the following command raytrace the scene specified in the file:

```
% gml scene.gml
```