

## Assignment 4

CMSC 427, Spring 2009

Due 11:00am, Tuesday, April 21, 2009

Maximum Score: 10 points

1. (2 points) Create a skybox around your scene. You can download free skybox textures from <http://www.xs4all.nl/~reije081/skyboxes/> or create your own. To create a skybox, render a cube centered around the camera with depth testing and lighting turned off. Once this is done, turn on depth testing and lighting and render everything else in the scene on top of it. If you wish you can use a sphere with cubemap texture coordinates instead, for a little more realism.
2. (1 point) Create a 512 x 512 heightmap for a terrain. You can use GIMP, Paint, or any other image editing program. The height of each point corresponds to the brightness of the grey-scale point. You will use this in the next part of the assignment.
3. (2 points) Using Blender (<http://www.blender.org>), create an `.obj` file from the height map and use your program to read it along with the bed etc from the last assignment. Refer to: [http://wiki.blender.org/index.php/Doc:Tutorials/Textures/Maps/Creating\\_a\\_Heightmap\\_from\\_a\\_Plane](http://wiki.blender.org/index.php/Doc:Tutorials/Textures/Maps/Creating_a_Heightmap_from_a_Plane) for help on this.
4. (3 points) Change the keyboard controls so that they work like in a First Person Shooter game:
  - a. pressing up-arrow moves you forward in the direction you are facing.
  - b. pressing down-arrow moves you backwards.
  - c. pressing left-arrow turns the direction you are facing to the left.
  - d. pressing right-arrow turns the direction you are facing to the right.
5. (1 point) Add fog to the scene. Experiment with parameters and the model of the fog (linear or exponential) till you get the fog that looks good.
6. (1 point) Create a video (e.g. `avi` file) of your finished scene. If you are on Windows, you could use the program `AviScreen` <http://www.bobyte.com/AviScreen/index.asp>. For Linux, there are several options available, including `XVidCap`. Choose a common codec to allow us to evaluate it easily.

Please submit a `.zip` file (or a `tar.gz` file) containing your code, your heightmap, your `obj` file, and your video. At the top of your program, put a comment telling what you did and didn't implement.