

## SG220 3D Game Engine Architecture

### KGA#2 – Game Customization Project

This assignment supports the following outcomes:

- Examine game engine architecture, APIs, and graphic functions.
- Explain how scene hierarchy, texture management, and graphic tools work together within game engine architecture.
- Customize a game engine by making level changes utilizing both script and code.
- Value the various elements which are involved in the process of modifying a 3D game engine.

#### Assignment

**Introduction:** This lab involves customization of the game engine. For customization you can modify engine code to add functionality. You can also add customization by adding in novel art elements, like new textures or models.

**Background:** In order to properly modify a game, there must be an "art pipeline" which allows artists to create art data and then transfer it to the game. The process typically involves some combination of scripting, using exporters, and copying files.

**Setup:** Make sure you have a working copy of the game engine (For example: Download from Chapter 16 of Allen Sherrod's book "Ultimate Game Programming with DirectX" or download one from the internet). Also make sure you have access to a graphics application compatible with your engine and an exporter that can export to the engine's file format.

#### Specifications:

- 1) Add a new level to your chosen game engine.
  - a) New level must have different ground, a different number of enemies, artifacts, and buildings.
  - b) Menu must support the additional level.
  - c) Completion of the first level should take you into the second level.
  - d) Score between levels should be cumulative.
- 2) Modify the functionality of either the keyboard or the mouse in the game.
  - a) The game must remain playable.
  - b) Suggested Functionality (At least two must be implemented):
    - i) Shot with the keyboard.
    - ii) Aim with the mouse.
    - iii) Move with the mouse.
    - iv) Provide a turbo mode to move faster.
    - v) Provide a precision mode to move slower (at least on the aiming with keyboard).
- 3) Document the changes made to the scripts and engine. Include observations and summarize the experience, contrasting it with what would be required without scripting. Explain how scene hierarchy, texture

management, and graphic tools work together within the architecture of the game engine.

**Deliverables**

- Modified game engine (Complete with documented code and/or scripts)
- Written report

**Grading Criteria**

The Game Customization Project Grading Rubric will be used to evaluate your assignment. Your instructor will provide you with the rubric along with this assignment handout.

**Resources**

Allen Sherrod text - "Ultimate Game Programming with DirectX"  
Milkshape 3D tool  
www.Turbosquid.com  
Game Art Program students  
Sample Code Handout

And the following links:

3D Game Engine List:

<http://cg.cs.tu-berlin.de/~ki/engines.html>

Database listing of Game Engines:

<http://www.devmaster.net/engines/>

Web Site for Professional and Amateur game developers

<http://members.tripod.com/gdata010/engines.htm>

Game Development Search Engine:

<http://www.gdse.com/servlet/gdse.links?s=1>

Commercial 3D Graphic Game Engines

[http://cg.cs.tu-berlin.de/~ki/game\\_eng.html](http://cg.cs.tu-berlin.de/~ki/game_eng.html)