IT426: Computer Games, Design & Implementation
Final Project Guidelines
Due: November 1, 2011

Earth is running out of non-renewable natural resources. Your task is to design a game that will educate people about recycling some of the waste products to bring them back into use.

*Natural resources are the materials in our environment that are used to make products, e.g. wood from trees to make paper. Non-renewable resources are those materials that cannot be replaced by natural ecological cycles or any management procedures, e.g. oil, plastics. Recycling is done to use a product more than once so that natural resources can be saved and so that less garbage is created. There are different ways to recycle. One way is to find a different use for a product. For example, empty cans can be used as pen holders. Another way to recycle is to use heat, chemicals, bacteria, or pressure to break a product down into its basic materials, and then to form these materials into the same or a different product.*

Design your game as follows:

- Design a game that is unique because it entertains the players while educating them.
- Create a 3D game world that gives the players plenty of opportunity to deal with a variety of physical settings, materials.
- Design the central theme and characters/actors such that the players can experiment and learn about the various strategies such as cooperation, competition, etc.
- Design the behaviour of the world elements and the characters/actors to follow simple laws of physics.
- Design the control the players have over the world; in terms of vision, reach, actions and interactions and movement etc.
- Design the use interface such that the players must be able to explore spatially and discover newer alternatives of combining or finding more uses for materials.
- Design the camera and its control parameters in terms of view, range, and navigation.
- Design for a target audience and design levels to include advanced users.
- Design the game mechanics and the game play to focus around your central theme to keep the game interesting and entertaining. Design for negative and positive feedback mechanisms to keep a sense of equilibrium throughout.
- Design the game rules to integrate a sense of adventure, a sense of purpose, a sense of competition, a sense of alacrity and a sense of safety.

Present your game as follows:

1. Outline the central theme and the story line, including target audience and learning.
2. Present the list of world elements, the character/actors and their behaviours.
3. Present an outline that gives a comprehensive account of the world, the characters/actors, the game rules, the game mechanics, the game play, the camera control and the user interface.
4. Present the game dynamics as a system view diagram showing the world elements, the character/actors, and the interactions with the help of feedback loops. The diagram
should clearly indicate the quantities that accumulate due to the reinforcing and the balancing loops in your game.

Your task will be to develop a small game, including the game design, graphical design, and actual implementation.

Only completed projects shall be accepted.

The type of game is up to you.

You must put equal emphasis of the project on game design and on game programming.

This project should give you an opportunity to explore and object-oriented program design.

Your project must attempt to improve the Panda3D engine. There are many areas where this can be achieved. The areas of potential improvements could be

1. Collision detection and response
2. Physics
3. AI
4. New graphics effects (Shader programming)
5. Alternatively, your project could focus on an algorithm that is vital to your game design.

**Deliverables:**

1. Design document. This has a comprehensive description of the game as discussed in the game design lectures. You may use illustrations where necessary.

2. The complete source code files. Include all models, textures and any other dependencies that may be required to build the executable version.

3. The executable file (Windows version). This must be built to run on any windows machine.

4. The submission must be placed in your folder on the..\stusan site. If the contents do not fit in your folder, you can submit a CD (verified).