**CSC 550: FINAL PROJECT – 3D GAME**

A close up of text

Description automatically generated

**Purpose of the Project**

This is the final project for CSC 550, Graphics Programming, in which you will need to design and implement a game from the 80’s with your own novel twist on it. The game should represent the culmination of your programming skills you have acquired this semester. I strongly encourage each student to challenge themselves and take their skills to the next level. This project must be your own ***original*** work; all projects will be checked for plagiarism, so do not use any code you find online.

**Deliverables**

1. The first deliverable will be project proposal, due on Saturday, Nov. 11 by midnight.
2. Before you start with implementation stage, you write game design, create game flow cart and test cases. Due on Sunday, Nov. 12 by midnight.
3. Once you are done with the preparation steps 1 and 2, you can start with game development by creating environment, characters, and collisions.
4. The next deliverable is a video of character-environment interaction and collision detection. In addition, you will submit a document describing test cases and current results your game produces when tests are executed. Based on the test results, you will describe updates needed to make your game logic complete. Due on Saturday, Nov. 18 by midnight.
5. Your final deliverable will be the entire Project submission and presentation on November 21.

**Scope of the Game**

A game scope is a term used to define the project’s perceived size and complexity. You must be able to complete your game before final presentation on November 21st. It is important to make your game sufficiently simple that you will be able to complete it, test it and iteratively refine it before the due date. Part of the challenge of this proposal is to show that you have created an interesting and novel game concept that can be implemented within the available time.

1. The game you will develop should have at least one active player playing against active opponents. For example, if you are implementing a car game, obstacles will move towards the car, and player will try to avoid collisions. Another example, if you are implementing a game with a spaceship and aliens, player will shoot at actively moving aliens.

***You should have:***

* One character for human player
* At least 5 characters for enemies/obstacles.

1. You are required to implement at least one-level game. The level timer should be set to 1 minutes. You will display running down time on the screen. Player loses the game if timer runs out, or player wins the game if they completed the level’s task.
2. Create environmental cube (your game will be exist within a cube). You will have to map texture to cube faces.
3. You will have to have at least 3 images. One for ground/walls/environmental cube, one for the main character, and one that will be used for opponents. You can have more.
4. You game should use translation, rotation, and scaling when necessary (characters moving in x- and y-axis) and collision detection.

**Requirements**

* Score displayed to the screen.
* **1 minute** count-down timer displayed to the screen.
* Guiding instructions displayed to the screen (should be short, ex: space – shoot, up-arrow – gas, down-arrow – break, etc.)
* 3 different sound effects (ex: coin collect, collision sound, shooting sound, etc.)
* 1 visual effect (pieces flying off when enemy is destroyed, car crumbles as it got hit, disappearing effect, etc.)

**Extra credit**

* +20 pts: create it a two-level game.
* +10 pts: create at least one AI character that will interact with the player. Example: If it is a car race, introduce a second car that will try to interfere with the player. If it is an alien shooting game, make one of the aliens attack the player.

**Proposal**

The goal of the project proposal is to describe the game you plan to create in enough detail to show how it will be played, why it would be interesting to play it, an innovative idea (your own twist on an old game), and what techniques you will use to create it.

1. **Describe the game.** Start with a one-sentence overview of the key game idea. This sentence should capture not just what the game is, but why it will be fun. For example: "The game is a fast-paced platformer where you control between one and four characters simultaneously", or "The game is a standard chess game, but when one-piece attacks another, the player must carry out a real-time combat to determine the outcome", or "We will create a tower-defense game that is played in the dark." Then elaborate this concept to a paragraph or two in length.
2. **Clearly explained your novel aspect of the game.** Provide a more detailed explanation of what is novel in this game. Your game might involve a novel game mechanic, a novel control scheme, a novel application domain, a novel target user group or a novel way of engaging player creativity - or may involve novelty in some other way. It is not sufficient to provide a cosmetic twist on standard forms of games, e.g., "a first-person shooter game played on a map of Jeffrey Hall." Once establishing the type of novelty, be clear about exactly what in the game will be novel. For example, if you are proposing a novel game mechanic, provide a clear description of the mechanic. Explain why this novel aspect is interesting and will be fun.
3. **Explain the game from the player's perspective**.

* Indicate the player's broad goals and activities.
* Clarify what the player does to complete each activity.

1. **Briefly describe game controls.** What keys on the keyboard or what mouse buttons/movements player will use.
2. In proposal, include all the images you will use for your environment and characters.

**Milestones**

|  |  |  |
| --- | --- | --- |
| **Start Date** | **End Date** | **Project state** |
| Nov. 11 | Nov 11 | Project Proposal |
| Nov. 11 | Nov.12 | Create design and flow chart |
| Nov. 11 | Nov.12 | Create Test Plan |
| Nov. 13 | Nov. 17 | Environment development |
| Nov. 13 | Nov. 17 | Character Development |
| Nov. 13 | Nov. 17 | Interaction/collision |
| Nov. 18 | Nov. 18 | Testing and identifying issues  Submit Demonstration Video and Test Cases with current results |
| Nov. 19 | Nov. 20 | Final Revision |
| Nov. 21 | Nov. 21 | Final Presentation and Project Submission |

**Final Presentation Order on Nov. 21**

For the presentation, you can create a PPT or you can simply talk about the following:

* Description of the game, game history, your novelty.
* Scope of the game.
* Skills you have demonstrated and main tasks you’ve completed.

Test plan: successes and issues/difficulties disclosure.

* What was your overall project experience.
* What would you differently (If anything).
* 5 min presentation (1 min of which is demo of the game).

I will have sign-in sheet on which you will be able to pick time slots for your presentation. On November 21, just in case, plan on staying a little over 1 hour and 15 min.