

Final programming project for CPE 476 – Spring 2013

Your primary project for this course consists of a team project to be completed in ~9 weeks. This is your chance to make a portfolio quality game/virtual environment. This project is worth 50% of your final grade in this class (plus 30% for individual technologies). We will hold a “game market place” to establish teams and final projects. This marketplace is a chance for potential managers or team members to “pitch” their game idea(s) to the class and try to form teams. Ideas that collect enough team members (4 total) can then proceed to develop their project, assuming the project meets the following criteria:

- Project is comprised of a single level complete game or interactive world with nice graphics (see below for details for specific graphics technologies),
- the project is reasonable sized and can be completed within given time and contains enough variation from other team’s projects,
- the project should aim to be a fun and enjoyable to interact with (i.e. winnable game or compelling interactive world),
- the project must include the following graphics technologies (or instructor approved substitution):
 - a nice complex environment with characters that navigate and interact with that environment.
 - some form of animation and some form of collision detection
 - some kind of game play (simple logic, score keeping, text, etc.)
 - simple audio
 - **shadows (your choice of algorithm, shadow maps or shadow volumes or baked shadows)**
 - **level-of-detail modeling (either terrain or character models)**
 - **some performance enhancing data structure (i.e. bounding sphere hierarchy, uniform spatial subdivision, etc.)**
 - **view frustum culling or other equivalent performance enhancing graphics algorithm**
 - **specialized graphics feature (deferred shading, NPR, normal mapping, level creation tool, sophisticated HUD, etc)**
 - **some game effect (e.g. particle system, lens flair, fog, billboard, etc.)**
 - **a complex pixel or geometry shader (must be approved by instructor, examples include: bloom, environment map, transform feed-back particles)**
 - some bonus feature (graphics or otherwise)*

*Note that the above list of technologies does not include a lot of features common in many games (i.e. AI or networking for example) you are welcome to build in these features but they do not supersede/replace any of the graphics requirements. They can, however, count for your bonus feature. In addition, nice assets (i.e. characters, textures, environments, etc.) are important to the look and feel of many games but creating or importing them do not count towards any of the graphics requirements but can be applied as your bonus feature.

Teams: It is assumed that each team will pick a manager and that team participants will specialize. For example, one break down may include: a level of detail specialist, a performance specialist, a shader specialist, an animation/collision specialist, and project lead. Managers will help decide grade distribution within the team (see below) and will be held responsible for getting their team to meet deadlines (i.e. the manager will be my point person of harassment). Part of each of your grades depends on your mutual assessment of one another.

A note about using outside references and technology/code: You are welcome to use any outside resource/code/technology that will help your team meet its goals (including assets, modeling programs, physics engines (not full collision), tutorials, audio libraries, etc.). However, **all** of the required graphics technology must be implemented by one of your team members in a way that does not take advantage of other classmates (i.e. you copying code from a tutorial for view frustum culling *is* taking unfair advantage of your classmates). You or some member of your team must understand/master all of the required graphics technology required for your game. In addition, you are required to list all references you plan to use in your final project proposal and in your project report. Be very careful when considering the use of outside technology, sometimes it takes as long to learn someone else's code as it does to write it yourself. ***You are required to individually take responsibility for three complex graphics technologies (with at least two coming from the technologies designated in bold in the above technology list) – to get credit for these technologies; you must review your individual code with the instructor in person. 30% of your final grade will be evaluated based on your individual creation of these graphics technologies and the associated code review.***

One cool thing: Your project will need to be a fairly complete single level game, however, I encourage your team should focus energy on 'one cool thing' that will make your game stand out. This might be a very rich visual environment or particularly cool character movement/interaction, or a visually exciting effect, or a very particular look/feel to the game, etc. Again, you need to include all the features specified, but focusing your effort on one very nice aspect of the game is a good way to make a simple game stand out.

Progress demos: You and all your team members are required to be present for 4 intermediary progress checks and the final demo of the project. **These demos are mandatory and will be graded.** At each demo, a portion of your grade will be awarded (i.e. the same portion of the project that should be done. In other words 25% of your grade for your final project will be assessed at the 25% check-in) If you miss a check off, you will automatically loose that portion of your final project grade. These check-offs will happen in lab on approximately the following dates:

- **25% done by 1/31 (First 25% of grade assessed)**
- **50% done by 2/14 (Additional 25% of grade assessed)**
- **75% done by 3/5 (Additional 25% of grade assessed)**
- **90% done by 3/14 (Additional 15% of grade assessed)**

- **100% done and demoed to entire class on 3/19 (final 10% of final project grade assessed + 3% final game play assessment)**

Note that for grading, I will assign each team a grade at the check-in. That grade can then be scaled based on feed-back from both the manager and the team members. Your team grade counts toward 50% of your course grade, your individual technology grade is 30% of your final course grade.

Formalized Game Proposal:

Each team must submit a 1-2 page write-up describing your final project and game design in more detail and present their game proposal in person in lab. Be sure to provide the team members names along with a designation of who the project manager is, on all submissions! Include your project goals (list of different project components/features) and a time line on when you plan to complete different pieces of the project. You will not be strictly held to this document but it serves as an initial contract between your team and I about what will be included in your project. This is an opportunity to start working on where you will get your assets (character models, world) what the look and feel will be, and what type of interactions you will support.

You are required to include in the write up:

- A storyboard overview drawing of your game
- a general description of the game
- a detailed description of the environment for the game (what it will look like and where you will get the models for the environment, e.g. terrain, etc.)
- a detailed description of the characters in the game (what they will look like and where you will get the models)
- a detailed description of the goal of the game (what is the character trying to do? what tools does the character have to achieve this goal?)
- a detailed description of the animations that will be used for moving the character (and any other moving aspects of the environment)
- a description of the general rules of the game
- a description of any special effects you will include in the game
- a description of the “one cool” thing that your team will emphasize in the game (i.e. the one thing you will make look really cool or interact in a sophisticated way, etc.)
- Some concept art to convey the look and feel of your game

This document can also serve as your 1st draft of the Project Report (which is just the final write-up/description of your project for this quarter, but will be your first draft of your senior project).

Due one week from team’s formation.

Final demo/report requirements held on 3/19 (final period):

- Project Demonstration. Each team will have 10-15 minutes to present their final project to the class. In addition, we will have some in class playability testing, where each team should have a playable version of their game set-up for class mates to try and assess (see below information).
- Project Report -- this is in the form of a web page and should contain the following information. Also note that links should be relative (not absolute paths), and that you should submit the html and all necessary image and animation files in the same directory.
 - brief description of your project,
 - a mini user's guide,
 - sample output i.e. images and *a short animation clip of your game is required*
 - a project executable
 - a list of all references used (e.g. tutorials, research papers, etc.)
 - Project submission (likely thru handin) information will be provided later.
- Project Grading.
 - No **late programs** will be accepted.
 - Your final grade will be the culmination of your demos throughout the quarter as specified earlier in this document.

Playability Testing – final assessment: Note that in addition to the 50% of your final grade for your team's game, which will be evaluated throughout the quarter for your final project, we will have some in class playability testing, during the final assessment time period the class. This will be a chance for everyone in the class to play everyone else's game. Your team will need to have your game installed and ready to play by others in the class. A strict rubric for grading one another's games will be provided and you will grade one another's game. This playability assessment, along with team members assessment of one another, will account for 3% of your final grade and will be a weighted summed total of the classes' assessment of your game and your team's assessment of its members.