Final Project Description

The culminating experience in this course is your own individual 3D computer graphics application. Please look at past examples to get ideas.

The sooner you start 'building' your project the more you will be able to add. For program 2, you could consider finding some models that you might want to test for your final project.

I am posting a draft description now to help you start dreaming about what you might want to build

Due Dates to Watch Out For

- Pitch you final project via sketch to canvas (submit sketch and brief description)
- For each program 3 / 4 you will need to clearly explain in your readme, how your program fits into the development of your final project
- Required in lab project check-in:(should be able to demonstrate some progress on the project) week 9 and 10!
- Final project demos in final exam time period (with write up included)

Overview

The culminating experience for this course will be your development of a final project. You have some room for creativity, but your final project must meet some clear technical requirements. All projects must include:

- (project 2)
    - complex environment (with ‘scene context’ (ground plane etc.) ‘background elements’ (trees or building) (models placed throughout the world, ground plane or terrain, and include a sky box)
- (project 3)
    - realistic (standard forward CG) lighting (including some textured models)
- (lab 4)
    - at least one hierarchically modeled animating character
- (project 4)
    - A `game camera’ to move throughout the world
- one particular graphics technology that you deepen your understanding of via the project

The project can be a game, a simulation, a story, or something new! Please look at past final projects for ideas and a sense of what is possible. We will spend the quarter building small parts of your final project, and yes you can change your mind somewhat as the quarter proceeds, but in general, spend the quarter building up an idea of what your final project will be. If you have a specific idea that is fairly 'off rubric' talk with me early.

We will start with:

- **Pitch your final project via a sketch to canvas(submit sketch and brief description)**

Write Up:
You will also need a more formal write up when the project is turned in.

The write up will be submitted to canvas and should include:

- Introduction: general description of the project
- Bullet list of how each required component was or wasn't met in your project
    - Complex environment with background elements
    - Lighting (including textured models)
    - Hierarchically modeled character
    - Game camera
    - Your enhanced technology
- **Highlight what graphics technology you deepend or learned**
- Images
- Any references

Please note that you will need to submit the source code, executable, and relevant data related to your final project to Github Classroom before the scheduled final time. ***In addition, you will need to submit a write up to canvas documenting your project (include project description, results images, how you met the required technologies, and references).*** All of these will be due the day of the final project presentations and will be turned in via Github Classroom. You will be doing an in class 5 minute presentation of your project – demonstrating the accomplishments of your project to your peers and the professor.

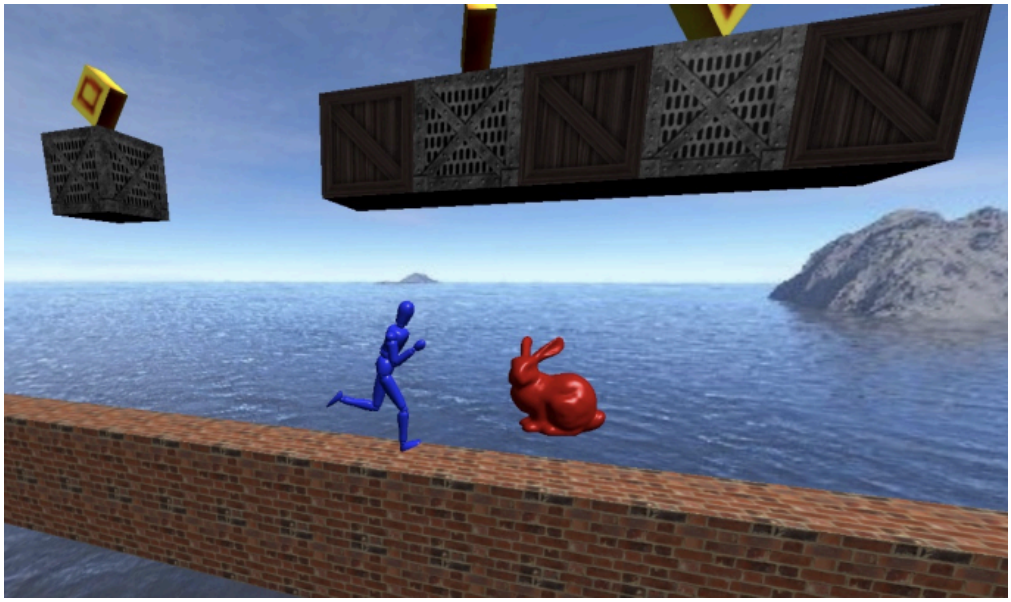
Projects will be classified as: easy, medium or hard. An easy project can earn at most 90 points, a medium project can earn at most 100 points, a hard project can earn 110 points.

Rubric

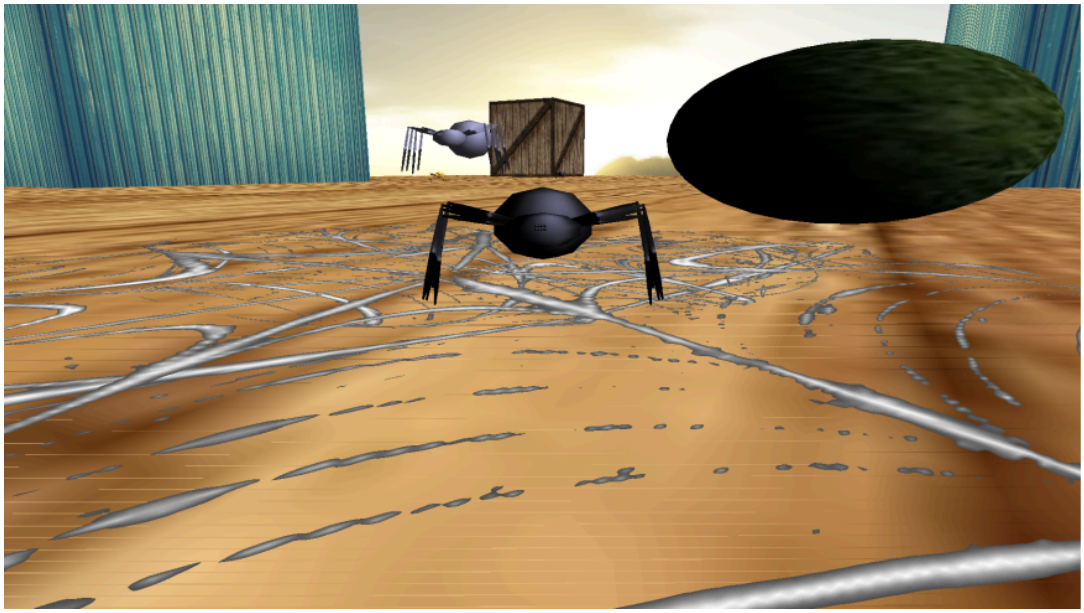
- 25 points: Complex environment with background elements
- 20 points: Lighting (including textured models)
- 5 points: Hierarchically modeled character
- 20 points: Game camera
- 20 points: Your enhanced technology (can get extra credit up to 30 points)
- 5 points: Your canvas write up
- 5 points: Your presentation

Example projects

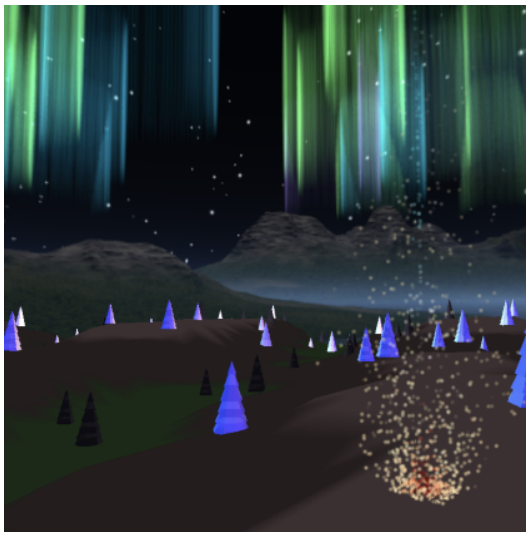
Chandler W19, Skinned mesh wolf walking through terrain



Conner W19, Hierarchically modeled person side scroller game



Nathan W19, Hierarchically modeled spider exploring its world



Arya and Megan 17 examples

Some Final Project Resources

We will talk about some of these, but for now, here are some resources for final projects:

To integrate **sound and music**: https://www.ambiera.com/irrklang/ or https://www.fmod.com/

Tutorial for integrating **text** rendering (using free type):
https://learnopengl.com/In-Practice/Text-Rendering

Interested in integrating more **physics based animation** (including basics of **particle systems**)?, Physically based modeling siggraph course notes:
https://www.cs.cmu.edu/~baraff/sigcourse/

One references about **skeletal mesh animation**: http://ogldev.org/www/tutorial38/tutorial38.html

Tool useful for reading other mesh formats (for skeletal mesh): https://www.assimp.org/

Interested in **fluid simulation**?: check out Jos Stam's "Real time fluids for games": https://www.semanticscholar.org/paper/Real-Time-Fluid-Dynamics-for-Games-Stam/5127ac7b58e36ffd13ca4437fc123c6a018dc436?p2df

Interested in image space effects (like **bloom or blur**), check out frame buffer objects: https://learnopengl.com/Advanced-OpenGL/Framebuffers

Interested in real **terrain**, check out DEMS: https://www.usgs.gov/faqs/what-types-elevation-datasets-are-available-what-formats-do-they-come-and-where-can-i-download?qt-news_science_products=0#qt-news_science_products

Have something else you want to explore, let me know.