CGT 520
Final Project Proposal
Due: Oct. 28, 2019

Final projects are to be done individually or in teams of at most 2 members. Prepare a project proposal of no more than 2 pages with the following format. Browse the textbook to get an idea of how to use the features we will cover in the second half of the class. Most features already have point values associated with them. See the **Point Values for Features** section below.

Proposal Format

- **Title of the project**
- **Names of team members**
- **Project description.** What does your project do? Is it a game, a tool, a demo? What will the final deliverables be?
- **Approach.** How will the problem be solved? What OpenGL features will you use? What additional components or libraries will you rely on? What assets (meshes, textures, etc.) will you need and how will you get them? Present your total point values for the features you plan to implement in this section.
- **Related work.** Cite previous literature (if this is a research related project) or other applications that are similar to your project.
- **Team member roles**. What tasks will be assigned to the various team members? What specific skills do those team members have that are relevant to their role on the project?
- **Schedule.** What milestones will be used to measure progress? Estimate the time of completion for the phases of the project. Recall that the final project presentations will be made in class on Tuesday, December 3 and there will be a status update demo on November 19. What will you be able to demonstrate at the status update?

This proposal will count as 10% of your final project grade. Submit your proposal by midnight on the due date.

Point Values for Features

Choose 100 points worth of features from the following list for teams of 1, or 200 points for teams of 2. Describe the point breakdown for your final project in the **Approach** section of your proposal.

- Interactivity
  - Camera can be controlled by user input (15 pts)
  - Other animation and motion events can be triggered by user input (15 pts)
  - Application responds to audio input (25 pts)
  - Game logic (menus, scoring, multiple levels) (25 pts)
  - Novel input device (e.g. 3d mouse, Kinect, Leap Motion) (25 pts)

- Animation
  - Physics-based motion (20 pts)
  - Collision detection and reaction (30 pts)
  - Hierarchical / skeletal animation performed in a vertex shader (40 pts)

    - Other procedural animation in vertex shader (10 pts)

- Rendering
    - Multiple viewports or windows (15 pts)
    - Texture mapping: 5 or more different textures on objects in your scene (15 pts)
    - Procedural texture computed in shader (10 pts)
    - Cube mapping for reflections or other effects (15 pts)
    - Planar reflections or shadows (15 pts)
    - Alpha Blending (10 pts)
    - Billboards / particle systems (20 pts)
    - Skycube (10 pts)
    - Terrain rendering (30 pts)

- Other features
    - Background music + 5 or more sound effects (15 pts)
    - Geometric complexity: 20 or more **different** meshes in your scene (25 pts)
    - Many shaders: Use 5 or more visually distinct shaders (20 pts)
    - Many lights: 10 or more light sources (point lights and spot lights) (25 pts)
    - Use of scene graph / BSP tree or other data structure (25 pts)

- Advanced OpenGL features (These will not be covered in class. You will need to research them on your own.)
    - Frame buffer object (30 pts)
    - Occlusion Query / Conditional Rendering (35 pts)
    - Instanced rendering (20 pts)
    - Geometry shader (30 pts)
    - Compute shader (35 pts)
    - Tessellation shader (40 pts)
    - Transform Feedback (35 pts)

- Platform
    - Application runs on tablet, phone (OpenGL ES), VR, web browser (WebGL) (30 pts)

- Other
    - Suggest a feature and a point value in your proposal. Subject to my approval.

Final Project Rubric

This proposal	10 %
Status update report. You will demonstrate your current progress on **November 19**	20 %
Final project presentation (in class December 3) • You must be present in class on Dec. 3 to get these points	10 %
Completeness (based on point values for features)	20 %
Style points • Aesthetics, polish, composition, other intangibles	10%
Final project report (due December 3) • Credit to other libraries and data you used • Describe which features you implemented for points	10 %
Final project deliverables (due December 3) • Code, including VS project file • Data • A 10 second video (1280 x 720)	20 %