Computer Graphics Term Project Directions

The entire project is due on December 1 2023 at midnight (11:59 PM)

Late Submission Policy:
1. Submit after the due time but within (including) 12 hours - 10% penalty
2. Submit after the due time but within (including) 24 hours - 20% penalty
3. Submit after the due time but within (including) 48 hours - 50% penalty
4. Submit 48 hours after the due time is NOT ALLOWED - 100% penalty

Submit Instructions
1. Please zip your project files and submit zip file through Canvas.
2. It is nice to include any readme file or instructions about your submission.

The .zip file you submit should include:
1. your source files (Everything! Including HTMLs, JSs, Libs, etc.)
2. A video of your game demos with explanations which requirements you have met.
3. A read me file to explain how to play your game and list the requirements you have met.
4. A Final Report

*You will lose up to 10% if you miss any of the required components.

Due Dates:
Sep 29: Group Formation / Individual – send me an email (qwang44@utm.edu) with title: CSCS 445 Term Project Group/Individual. If you are in a group, only one member of your group should send this, but you should include the names of all the members (2-4) of the group in the email.
Oct 6: Project Proposals Due
December 1: during class: Final Presentation
December 1: Codes, Video, ReadMe, and Final Report Due @ 11:59 pm

Term Project Choice 1 – Group Project

Objective: Create a real-time **3D** interactive environment or mini game with WebGL

Four person teams: for example,
1 – Graphics programmer – textures, interactivity, or game mechanics
2 – Graphics programmer camera movement and 3D trans, ray casting for bullets
3 – Graphics programmer - Project Manager, textures, collision detection
4 – Graphics programmer – lights, game AI, level design

There are other jobs but the point is that **EVERYONE** will be responsible for a significant portion of the graphics programming

Technical requirements for an WebGL design and development:

- 3D transformations and camera movement
- Multiple Lights
- Textures
- User Interactivity
- A playable environment/game (1 level of a game)
    - This requirement is based on the proposed game
        - Examples of games people have done before:
            - 1st Person Shooter/Action
            - Tower Defense
            - Racing
        - This could include collision detection (feel free to use sphere collisions), free physics engine is allowed, artificial intelligence etc.

Extra Credit

- Audio (e.g. OpenAL)
- Additional effects from below or the topics section of the individual tech demo final project options. See that section for details.

You can download the following from the web to increase quality (MAKE SURE TO CITE YOUR SOURCES IN THE REPORT):

- 3D Models (e.g. http://www.turbosquid.com)
- Physics engine
- Textures
- Sounds/Music

Grade Breakdown:

- 60% technical components
- 25% originality / quality
- 10% final presentation
- 5% report

Proposal: Turn in by **Oct 6** (1 page document):

- Schedule
- Plan broken up into 4 tiers of completeness
- Roles and proposed tasks for each person
- Risky Areas/Backup Plan
- Design document (describe game play, interaction, and graphics)
- After you submitted your proposal, please make an appointment with me to discuss your proposal.

Final Demo **December 1**

- be ready to demo

Group Report (1-2pages. Single spaced, 12 pt Arial font) (DUE: **December 1** 11:59PM)

Describe your project, and include technologies incorporated. Discuss what works and what does not work, based on what you originally proposed and any other features you have implemented.

Individual Report/Group Member Assessment

Discuss what each person in your group worked on.
Assign a grade to each group member (i.e., A,B,C,D,E)

Term Project Choice 2 – Individual Tech Demo

Objective: You must implement and ENHANCE one graphics effect that was not already in a previous project and give a short presentation that teaches everyone how it works and what you did to enhance/improve the algorithm/technique/effect.

Directions: **NOTE: ALL CODE MUST BE WebGL COMPLIANT!** E.g., the things that need render to texture should use a Frame Buffer Object. However, if you anticipate hardware issues with your implementation approach, let me know in advance. Many of the following have example code associated with it, which you are free to use and modify, but keep in mind that some of it may not be up to date or use a different shader language (e.g., Cg). You may need to do additional searching on your own to get things to work. Then do something to improve or enhance it (THIS ENHANCEMENT IS A SIGNIFICANT PORTION OF THE TECHNICHAL GRADE)

Topics:

Choose from the following list (or you can propose something to me if there is something else you are particularly interested in):

- Advanced Collision Detection and Response
    - AABB (http://www.gamasutra.com/view/feature/3426/when_two_hearts_collide_.php)
    - OBB (http://www.gamasutra.com/view/feature/3383/simple_intersection_tests_for_games.php)
    - Physics Simulation (http://gafferongames.com/game-physics/), (http://www.gamasutra.com/view/feature/3032/exploring_spring_model.php)
- Particle Systems (http://www.videotutorialsrock.com/opengl_tutorial/particle_system/home.php)
- Integrate a 3D User Interface
    - wii-mote interaction (http://www.brianpeek.com/page/wiimotelib.aspx)
    - Kinect interaction (http://www.microsoft.com/enus/kinectforwindows/develop/overview.aspx), (http://projects.ict.usc.edu/mxr/faast/)
    - artoolkit interaction (http://www.hitl.washington.edu/artoolkit/)
    - or propose something else that is relevant to graphics…

Grade Breakdown:

- 80% technical components
- 10% final presentation
- 10% report

Proposal: Turn in by **Oct 6** (1 page document):

- Schedule
- Plan broken up into 4 tiers of completeness
- Risky Areas/Backup Plan
- After you submitted your proposal, please make an appointment with me to discuss your proposal.

Final Demo **December 1**

- be ready to demo

Final Report (1-2pages. Single spaced, 12 pt Arial font) (DUE: **December 1** 11:59PM)

Describe your demo, focus on how the included technology works and how you implemented it. Discuss what works and what does not work, any other features you have implemented, and describe ways to improve it or add to it in the future.