CSE 3541: Lab 6 - Project - Undergraduate level

Proposal/Specification due: Friday November 8th, 5pm
Due November 27th, 11:59pm
Because of time constraints for turning in final grades, late submissions for lab 6 must be submitted by Monday December 2nd 11:59pm to recieve any credit.

Task:

As an undergraduate student taking this course, your task is centered on implementation - either a short animation, a mini-game, or tool for procedural content. Your implementation should make use of an algorithm or technique not already implemented in previous labs or be a significant extension of an earlier lab. You are encouraged to continue using Unity be are free to use other development environments as long as you provide the grader with instructions to build your project (for the sake of convenience, you may also be asked to schedule a demo with the grader in addition to turning in your work on Carmen). You will have approximately 3 weeks for the project, so you should aim to produce more than you did for earlier labs. If you are doing the recommended 2 hours of work outside class per credit hour per week expect to spend around 18 hours on it. You may work with a partner on the project if you increase the complexity of the project and clearly define work responsibilities in your project proposal.

Logistics:

Determine the topic you would like to work on and send the instructor an email describing your project (in one or two paragraphs) so I can determine if the level of difficulty is appropriate. A few ideas are listed below; you must still email the instructor if you are choosing from the list below. You do not have to use Unity to develop your project, but it is encouraged if you do not have experience with another 3D graphics capable development environment. You may use Unity's built-in animation tools like rigid bodies and colliders and third party code as long as you provide documentation on what you implement vs. what you use for help. Still submit all packages/project folders and documentation on Carmen.

Grading:

Grading of lab 6 (out of 15 points) is based on several factors.

1. Challenge - is the amount of work appropriate to 3 weeks of work outside of class?
2. Results - did you accomplish the task in your project proposal? If not, you can compensate by writing a short report (1 page or less) documenting difficulties encountered and any changes you had to make to your project.
3. Effort - did you put in the time to work on the project? This is evaluated by the complexity of your results and thoroughness of any documentation or report provided.

4. Timeliness - did you send your proposal and finish your project on time?

Sample project ideas (nowhere near exhaustive, and not all topics will be enough for 3 weeks of work so you may need to mix and match):

- Implement procedural maze creation.
- Implement and experiment with different pathfinding algorithms.
- Implement procedural story/text/quest/mission generation.
- Use springs and physically based animation to create blobby or cloth-like objects.
- Create a realistic urban crowd simulation that includes pedestrians and vehicles.
- Procedural create video game levels.
- Procedurally create terrain or fluid surfaces.
- Simulate fluid dynamics (note: this can be a lot of work if you also want to do surface construction of volumetric data).
- Create an articulated figure and procedurally animate it's linkages in an interesting way (forward kinematics).
- Implement an inverse kinematics algorithm. (note: this can be hard without a thorough understanding of hierarchies in Unity)
- Simulate hair or fur.
- Implement an algorithm from a research paper in a computer graphics, animation, or games conference. See the instructor if you want more information on this possibility.
- Learn how to use other professional software tools used in game and animation production and write a short report on how you learned the tool and what you did with it. Some possibilities include Maya, 3D Studio Max, MotionBuilder, or a 3D game engine other than Unity.