CMPM 164 F2019
Game Engines

Homework 4 – Final Project

For the final project, you will work in groups of two or three to implement a graphics technique of your choice, and also integrate your work into a high-quality 3D scene using the Unreal game engine. The assignment has multiple stages, and the final deliverables include a git repo containing your code, presentation materials, documentation in the style of an ACM SIGGRAPH conference paper, and a short video of your work. Since the goal is to create a great looking scene in order to emphasize a particular effect or technique, you do *not* need worry about gameplay, it doesn't need to be interactive, and you are welcome to use pre-existing assets.

Topic ideas

- Real-time ray tracing, Denoising

- Global Illumination, Path tracing

- Fluid dynamics

- Agent-based simulation

- Non-photorealistic animation and rendering

Schedule / Checkpoints

Week 8: Presentation of team, project idea, and work plan – Due in class on Nov 13th (or Nov 15th if class is postponed due to the strike)

Who is on your team? How do you expect the work to be divided up? What will each person work on? What do you imagine your final output will look like?

Week 9: Survey of techniques relevant to your project – Short (~5 min) informal presentation due in class on Nov 20th

What techniques can you find that are related to your final project? What specifically do you plan to implement? List book chapters, articles, tutorials, blogs that you plan to read/use in order to develop your final project.

Week 10: Progress report and feedback on current work – Slide presentation (~10 min) due in class on Nov 27th

Present your initial implementation of your final project and outline your plan for finishing it over the next two weeks. Think about what kinds of comments would most useful for you and use the class to get feedback. If possible, show the class examples or videos of what you expect to implement.

Week 11: One-on-one meeting with instructors – By appointment, in E2-259

You will meet with the instructors for around 20 minutes during the last week of class (Dec 2nd through Dec 6th). We will meet in my office (E2-259) instead of in PSB 114.

Finals Week: Final presentation – Slide presentation (~15 to 20 mins) on Mon, Dec 9th at 8am in class

We will use our assigned period during exam week for presentations of final projects in room PSB 114. You will present your final project by running it in Unreal Engine, or by showing a high-quality screen capture of your scene. Additionally, you will present slides that summarize the work that went into creating the final project.

All deliverables are due on Mon, Dec 16th by 12noon

This deliverable will be in the form of a link to the git repo for the final project, consisting of the following:

1. <u>Code</u> for the final project.
2. Highlight <u>video</u> of the final project: Include a short video (~1 or 2 minutes long) showing off most relevant parts of the project.
3. The slide <u>presentation</u> from Dec 9th. (You are welcome to add some additional details to this slide, i.e., it can expand on the ideas which you originally presented in class).
4. A <u>write-up</u> in the style of a SIGGRAPH poster paper or short paper (see below).
5. A "<u>readme</u>" file that lists all team members and their role in the project, along with instructions for running/navigating the project, and links to the items above.

- You will write up your results using the SIGGRAPH "ACM Standard" Proceedings template, which can be found at https://www.acm.org/publications/proceedings-template.

You should use this .doc file as a template if you are using Word: https://www.acm.org/binaries/content/assets/publications/word_style/interim-template-style/interim-layout-.docx

Or this LaTeX template if you are using LaTeX: "sample-sigconf.tex" from this zip file: https://www.acm.org/binaries/content/assets/publications/consolidated-tex-template/acmart-master.zip

- Your paper should explain the technical challenges and creative vision of the project, and include enough detail– both in the text and with figures and images– for someone with graphics programming skills to recreate the projects. There is no mandatory length requirement for the paper, somewhere between 4 and 8 pages is probably sufficient. You won't need to reproduce the code itself in the paper, but pseudocode / algorithm / implementation details could be useful. If you have any questions, feel welcome to reach out to me and Montana.

<u>Grading</u>

Technical implementation - 40%
Visual aesthetics - 30%
Documentation and presentations - 30%