Research Paper

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GPR-400 Advanced Real-Time Rendering
Instructor: Daniel S. Buckstein
Final Project

Summary:
The primary takeaways of this course are, in no particular order or rank, ***portfolio*** and ***engineering***. Furthermore, research is emerging as an invaluable part of any major studio or tech company's pipeline to inform design and development. One of the primary responsibilities of programmers and developers above senior or lead ranks is to research and invent new technologies, and envision the direction of their engine and games. For this assignment, in tandem with the final project, you will write a conference paper that could potentially be submitted to a graphics and real-time rendering conference, such as SIGGRAPH. You will also create the accompanying conference seminar which you would use to present the paper work at the same conference, or a more industry-oriented one such as GDC.

Submission:
Please submit the following:

- Your final paper as a PDF.
- Annotated bibliography of all sources cited in paper (you started this in the first milestone).
- Any additional links pertinent to the paper (e.g. if you are making your implementation available, the GitHub link).
- The link to a very short video recording about the paper, discussing your justification for conference selection and format.

Requirements:
Design requirements: These count towards the organizational part of the project:

- The paper must follow the exact template or specification outlined by your selected conference.

Content requirements: These count towards the implementation part of the project:

- The paper template is established by the conference, but the content should "tell a story" and follow a structure. The paper should be between 6-8 pages in length, depending on the conference specifications. Here is a recommended paper structure, which we will discuss further in class:
  - *Abstract*: Summarizes the entire paper; this is usually always published on the web or in a conference proceedings or brochure.
  - *Introduction*: Describes the problem, state research question and hypotheses (if applicable) and summarizes the approach.
  - *Related works*: Brief summaries of existing research and works in the field, studying the same or related problems.
  - *Method*: Describe your methods, approaches, tools, studies, processes, formulas, etc. in detail.
  - *Results*: Describe the objective results of the study, present the raw data and explain it as-is.
  - *Discussion*: Describe the subjective interpretation of the results.
  - *Conclusions and future works*: Summarize the paper again and describe future directions and takeaways.
  - *Works cited*: Formal citations of cited references (not annotated).
- Clearly describe the goals of the project and research, and how you studied the topic of interest to reach some tangible results and/or conclusions. If you are running some performance study or experiment, this must be clearly outlined as the "recipe" for others to reproduce.
  - **Note: All results, positive or negative, are good results; you and your readers will learn from them! Don't be afraid to take risks and produce novel things!**
- Your paper should make use of the final project in a meaningful way, as the primary tool or resource for whatever it is you are studying or researching.
  - **These requirements may be updated and clarified over time to best reflect the progress of the course and lessons**.

Presentation requirements: These count towards the demonstration part of the project:

- The paper must have an appropriate structure and flow, make appropriate use of diagrams and tables, and minimize typographical errors (such as line overflow). I recommend using LaTeX to write the paper; we can talk about this later. I.e. the paper must look professional; read some related works and look at other conference papers for inspiration.

- Short (5 min) justification video showing the paper and briefly explaining your structure and format.

Points	10
Submitting	a text entry box or a file upload
File Types	pdf

Due	For	Available from	Until
-	Everyone	-	-

GraphicsAnimation-Master-Range-x2

Criteria	Ratings			Pts
IMPLEMENTATION: Architecture & Design Practical knowledge of C/C++/API/framework programming, engineering and architecture within the provided framework or engine.	**2 to >1.0 pts** **Full points** Strong evidence of efficient and functional C/C++/API/framework code implemented for this assignment; architecture, design and structure are largely both efficient and functional.	**1 to >0.0 pts** **Half points** Mild evidence of efficient and functional C/C++/API/framework code implemented for this assignment; architecture, design and structure are largely either efficient or functional.	**0 pts** **Zero points** Weak evidence of efficient and functional C/C++/API/framework code implemented for this assignment; architecture, design and structure are largely neither efficient nor functional.	2 pts
IMPLEMENTATION: Content & Material Practical knowledge of content relevant to the discipline and course (e.g. shaders and effects for graphics, animation algorithms and techniques, etc.).	**2 to >1.0 pts** **Full points** Strong evidence of efficient and functional course- and discipline-specific algorithms and techniques implemented for this assignment; discipline-relevant algorithms and techniques are largely both efficient and functional.	**1 to >0.0 pts** **Half points** Mild evidence of efficient and functional course- and discipline-specific algorithms and techniques implemented for this assignment; discipline-relevant algorithms and techniques are largely either efficient or functional.	**0 pts** **Zero points** Weak evidence of efficient and functional course- and discipline-specific algorithms and techniques implemented for this assignment; discipline-relevant algorithms and techniques are largely neither efficient nor functional.	2 pts
DEMONSTRATION: Presentation & Walkthrough Live presentation and walkthrough of code, implementation, contributions, etc.	**2 to >1.0 pts** **Full points** Strong evidence of accuracy and confidence in a live walkthrough of code discussing requirements and high-level contributions; walkthrough is largely both accurate and confident.	**1 to >0.0 pts** **Half points** Mild evidence of accuracy and confidence in a live walkthrough of code discussing requirements and high-level contributions; walkthrough is largely either accurate or confident.	**0 pts** **Zero points** Weak evidence of accuracy and confidence in a live walkthrough of code discussing requirements and high-level contributions; walkthrough is largely neither accurate nor confident.	2 pts
DEMONSTRATION: Product & Output Live showing and explanation of final working implementation, product and/or outputs.	**2 to >1.0 pts** **Full points** Strong evidence of correct and stable final product that runs as expected; end result is largely both correct and stable.	**1 to >0.0 pts** **Half points** Mild evidence of correct and stable final product that runs as expected; end result is largely either correct or stable.	**0 pts** **Zero points** Weak evidence of correct and stable final product that runs as expected; end result is largely neither correct nor stable.	2 pts

Criteria	Ratings			Pts
ORGANIZATION: Documentation & Management Overall developer communication practices, such as thorough documentation and use of version control.	**2 to >1.0 pts** **Full points** Strong evidence of thorough code documentation and commenting, and consistent organization and management with version control; project is largely both documented and organized.	**1 to >0.0 pts** **Half points** Mild evidence of thorough code documentation and commenting, and consistent organization and management with version control; project is largely either documented or organized.	**0 pts** **Zero points** Weak evidence of thorough code documentation and commenting, and consistent organization and management with version control; project is largely neither documented nor organized.	2 pts
BONUSES Bonus points may be awarded for extra credit contributions.	**0 pts** **Points awarded** If score is positive, points were awarded for extra credit contributions (see comments).		**0 pts** **Zero points**	0 pts
PENALTIES Penalty points may be deducted for coding standard violations.	**0 pts** **Points deducted** If score is negative, points were deducted for coding standard violations (see comments).		**0 pts** **Zero points**	0 pts
				Total Points: 10