

CS 4204 Final Exam Review

Final exam: Friday, May 2, 10:05 AM – 12:05 PM, McBryde 318

NOTE: This review covers only material since the second midterm (shaders, virtual environments, and animation). The final, however, will be cumulative.

Short Answer / Conceptual Questions:

1. What are programmable shaders? How does the shader concept differ from traditional graphics processing techniques?
2. What is the difference between a vertex shader and a fragment shader?
3. Give an example of a situation where you might use a vertex shader. What computations would the vertex shader program do in this case?
4. Give an example of a situation where you might use a fragment shader. What computations would the fragment shader program do in this case?
5. What makes a virtual environment “immersive?”
6. What depth cues can be provided by an immersive VR system that are not provided in desktop virtual environments? How are these depth cues provided when using a head-mounted display? When using a CAVE?
7. What is the accommodation-convergence mismatch? What type of display hardware can overcome this problem, and why?
8. Why must typical 3D rendering engines be modified to work with projection-based, stereoscopic, head-tracked VR display hardware (such as the CAVE)? Give at least two reasons.
9. Name and describe two of the Disney principles for believable animation. Give an example of how each of the principles would be used in an animation of a non-human character (such as the cars in the Pixar movie *Cars*).
10. Name the most common method of describing or specifying animations. Name and describe an alternative method for specifying animations.
11. In keyframe animation, what is a channel? What data is specified in a single channel? How many channels are needed to specify an animation for an articulated figure?
12. Briefly describe the process of determining the value of a particular degree of freedom at a particular time t in an animation, assuming you are given a channel for that DOF.
13. Give an example of a type of animation that is very difficult to produce, and describe why this type of animation is so challenging.