MANCHESTER 1824
The University of Manchester

COMP37111: Advanced Computer Graphics

Workshop 9 : Volume Rendering

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Breakout 1

1. Which parts of the volume rendering process can be parallelised?
   ray casting
2. Why is Direct Volume Rendering not typically appropriate for interactive applications?
3. Where does the colour of materials come from in Volume Rendering?
4. Why might Direct Volume Rendering be preferable for a medical application, such as identifying a malignant tumour in otherwise healthy tissue?
5. What is the temporal and spatial complexity of a basic voxel grid structure?

Breakout 2

1. Explain why there are 14 cube configurations in the Marching Cubes algorithm.
2. What is the purpose of sub-voxel sampling?
3. Although the images created from Direct Volume Rendering are viewpoint dependent, not all parts of the process take the viewpoint into account. If you were moving the viewpoint around, which calculations would be valid regardless of the viewpoint's position?
4. What unwanted visual artefacts might be caused by trilinear interpolation? How could this be improved?
5. How does the **Nyquist rate**[W] relate to Volume Rendering?