Definitions

- Optical Model
  - "lacking definition"

General Notes

Implementation Details

Reread section.

Notes

- Data Representation
- !Proxy Geometry!
- "Depending on the kind of proxy geometry used, either a single 3D texture object or one to three sets of 2D texture slices are created"
- padding
- gradient computation

cont...

- "Transfer functions emphasize regions in the volume by assigning color and opacity to data values."
- "Histograms are useful for analyzing which ranges of values are important in the data."
- "The output of the data-processing step is a set of textures that are downloaded to the GPU in a later stage"
- "It is sometimes more efficient to combine several textures into a single texture.I"
- "There are several ways to generate texture coordinates for the polygon vertices"

Proxy Geometry

Poorly understood

Rendering

Transfer Functions

- "The role of the transfer function is to emphasize features in the data by mapping values and other data measures to optical properties."
- "Using data value as the only measure for controlling the assignment of color and opacity may limit the effectiveness of classifying features in the data."
- "Typically, the interface consists of a 1D curve editor for specifying transfer functions via a set of control points."
- EQ3

Illumination

- Blinn-Phong model
  - EQ4
  - "For volume rendering, the Blinn-Phong model is frequently modified, so that only those regions with high gradient magnitudes are shaded"

Compositing

- EQ`s 5 and 6 used to: "To efficiently evaluate the volume rendering equation (Equation 1)"

Advanced Techniques

Volumetric lighting

- "Furthermore, this kind of lighting assumes a surface-based model, which is inappropriate for volumetric materials."

- "use a pixel buffer to accumulate the amount of light attenuated from the light's point of view.to do this efficiently..."

  - Essa parte parece bastante importante entender, quem sabe algo que podemos focar.

- " It is possible, however, to extend Algorithm 39-3 to approximate certain scattering phenomena. One such phenomenon is translucency,..."

Procedural Rendering

- "Procedural noise simulation is a powerful technique for adding detail to low-resolution volume data "

Performance Considerations

- "the transparent proxy geometry used in volume rendering cannot leverage the early depth-culling capabilities of modern GPUs"

- "For these reasons, it is important to draw proxy geometry that generates only the required fragments.i"

- "The rasterization pressure is reduced by making the viewport smaller, decreasing the sample rate, using preintegrated classification , and by not drawing empty regions of the volume "

- ". Achieving peak performance requires finding the correct balance of fragment operations and texture reads, which can be a challenging profiling task."