ImageVis3D
Large Scale Volume Rendering

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Outline

1. Volume Rendering
2. Large Data
3. ImageVis3D
Volume Rendering

- Light transport through a volume
- Pretend volume is partially translucent
- Discern 3D characteristics from 2D projection
What is “LARGE”?
About Largeness . . .

“Large” may be something that does not fit

- into GPU memory ( > 128 MB – 4 GB )
- into main memory ( > 2 GB – 64 GB )
- onto the local drive ( > 0.5 TB – 10 TB )
- into 32 bit address space ( > 4 GB )
- into 64 bit address space ( > 16 EB )
Large Data Visualization

Figure: 12 GB

Figure: 600 GB
Techniques

- Out of core
- Bricking
- LOD
- Culling
Outline

1. Volume Rendering
2. Large Data
3. ImageVis3D
ImageVis3D

- Lightweight application
- Interactive
- Large Dataset Support
- Flexible UI
- Support a wide range of hardware & software
- Foundation for other apps, research projects
- MIT License
Lightweight Application

- ImageVis3D is only about 5 megabytes
- No 3rd party dependencies sans Qt
- (Hopefully) Easy to use
- Easy to compile yourself

```
svn co https://.../svn/imagevis3d
qmake
make
```
Interactive Large Data Support

- Works on any dataset that fits on a hard disk or in a 64bit address space...whichever is less (please let us know when the latter becomes an issue 😊)
- LOD system allows for interactive exploration regardless of the dataset size.
- Implements its own multitasking system, allowing for fine-grained control.
Flexible UI
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ImageVis3D

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Volume Rendering

Large Data

ImageVis3D
Support a Wide Range of Hardware & Software

**Hardware:**
- OpenGL 2.0+ GPUs
- OpenGL 1.4+ with GLSL extensions
- (Soon) DirectX 10 GPUs

**Software:**
- Windows XP & Vista (both 32- and 64-bit)
- Mac OS X 10.4, 10.5
- Linux
Foundational Work

- Clear separation of UI, rendering code
- Renderer designed as an API
- Already being integrated into VisIt
- Soon to make its way into SCIRun
ImageVis3D

- Getting ImageVis3D
  - http://software.sci.utah.edu/
  - Developer builds:
    http://software.../devbuilds/imagevis3d/
  - Source: subversion on ‘code.sci.utah.edu’

- Support
  - iv3d-users@sci.utah.edu

- Questions?

- Tutorial