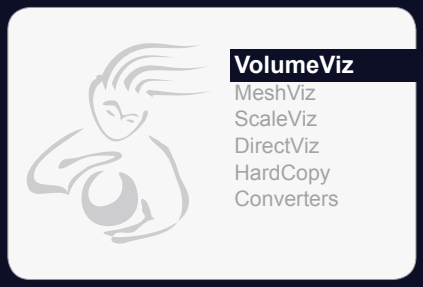
VolumeViz Extension

The High-performance Volume Data Visualization Toolkit

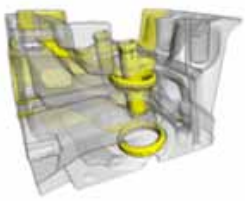
- Managing multi-data and attributes on the fly
- Delivering interoperability with high-performance computing
- Roaming hundreds of GB on a laptop
- Managing multi-resolution data efficiently



VolumeViz enables rich interactive visualization of complex volume data sets. Volume rendering, slicing, iso-surface display, and embedded 3D geometry can be combined in a single Open Inventor®-based application.
Very large data sets that cannot be loaded in memory can even be visualized interactively by using the VolumeViz LDM (Large Data Management) option.

VolumeViz supports multiple data sets with data-transforming and data-combining techniques, as well as render combining for even faster and higher quality visualization. Using the latest GPU shader technology, information acquisition and 3D perception are further enhanced by using lighted volume visualization and bump-mapping on slices.

Beyond volume visualization, VolumeViz allows software developers to integrate high-performance computing code through the Open Inventor® by Mercury toolkit. The data access API facilitates the interoperability of VolumeViz with NVIDIA®'s CUDA™ language and provides application developers with a unique, integrated solution for combined visualization and computation, even for out-of-core 3D data (using VolumeViz LDM).



VolumeViz Key Features:

- High-level object-oriented API
- Direct volume rendering using 2D or 3D textures
- Fast rendering of volume "skin" for opaque subvolumes
- Powerful and flexible memory management, with data access API
- Render axis-aligned (ortho) or arbitrary (oblique) slices
- Mapping of volume data onto arbitrary geometry
- Predefined and user defined transfer functions
- Predefined and custom input formats
- Multiple volumes in the same scene
- Mixed volume and polygon data
- Faux shading
- Edge coloring
- Picking/probing on volumes and slices, selection facilities
- High-quality rendering, lighting and isosurfaces accelerated by GPU
- Multiple-dataset support (multi-channel rendering)
- CPU or GPU data combining
- Automatic refinement of displayed image
- Scalable performance
- Cluster rendering support
- Interactive navigation of very large data sets using the LDM option
- Interactive even on low-end machines
- Multi-resolution rendering support of height fields, e.g. seismic "horizon" surfaces

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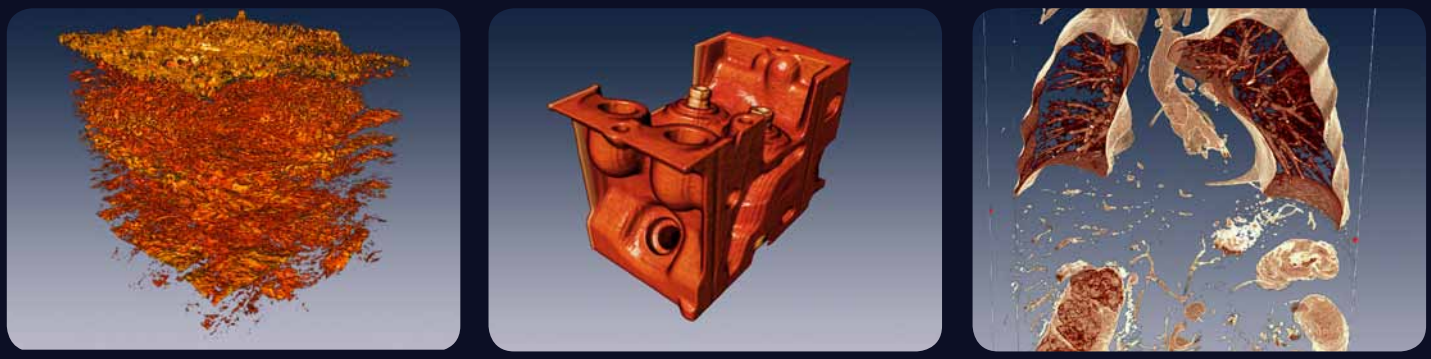


Beyond Volume Visualization: the LDM Technology

VolumeViz LDM (for Large Data Management) enables access to out-of-core data with optimized multi-resolution management. VolumeViz LDM also provides a rich data access API that allows applications to take advantage of the LDM technology for accessing data associated with a sub-volume, plane, point or poly-line at arbitrary resolution. This makes VolumeViz LDM not just a visualization toolkit but also a powerful middleware for volume data management.

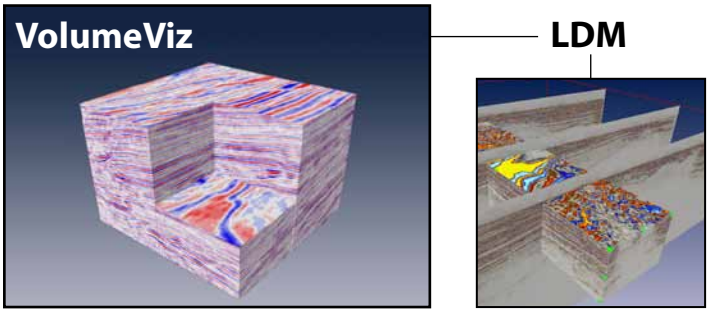
VolumeViz and GPU Computing

VolumeViz offers seamless integration between high-performance computing and high-quality visualization for very large 3D data volumes, or any highly demanding computing tasks in the interpretation and simulation workflows.

The CUDA-VolumeViz API provides developers with possibilities for massive dynamic or static computation capabilities on volume data with simultaneous 3D visualization feedback. For example, geophysicists are used to taking advantage of their 3D workstation to extract the best data from their seismic volumes. Some tasks require access to a supercomputing datacenter to run very complex algorithms on large and complex data volumes. This solution offers the kind of processing power normally found in a supercomputer on a standard workstation.

GPU Computing and LDM

Check our '*Data Management for Computing with VolumeViz LDM*' Programming Guide of Open Inventor which explains how to efficiently load LDM data using synchronous and asynchronous calls, how to create a new LDM data file on disk, and how to create an LDM volume in memory.



VolumeViz LDM is a superset of the VolumeViz extension, available through a separate commercial license, which provides all features of VolumeViz plus the LDM technology.

Bricks for Building Solutions

VSG provides a full range of high-level software components that help create value-added solutions for industrial-strength applications:

- **Open Inventor®** by Mercury delivers a complete object-oriented 3D graphics toolkit for the development of 3D graphics applications.
- **MeshViz and MeshViz XLM extensions** provide high-end 3D scientific data visualization, including regular and unstructured mesh support and advanced representations for multidimensional data.
- **ScaleViz extension** enables rendering distribution on clusters for Open Inventor®-based applications.
- **HardCopy extension** allows applications to output graphics in several vector formats (HPGL, Postscript, CGM, GDI/EMF, and others), and to publish interactive 3D models in PDF documents.

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