Our high-end software solutions range from 3D components for application developers (Open Inventor®) to advanced 3D visualization software for engineers and researchers (Avizo®), offering an extensive set of technologies and tools for exploring your very large seismic, geology, reservoir engineering, petrography, and scientific datasets.

VSG brings performance and high quality to your geophysics and geology data exploration with:

**Open Inventor®, for application developers,** has been widely adopted as the core 3D visualization component for oil & gas and geosciences-related applications. Open Inventor delivers enhanced productivity, performance, flexibility and reliability for developing your most demanding applications that require robust and evolutionary technologies. Open Inventor extensions add specialized rendering capabilities for volume visualization (VolumeVizLDM), distributed rendering (ScaleViz), scalar or vector data fields visualization (MeshViz and MeshVizXLM), and 3D graphics output (HardCopy).

**Avizo® software, for engineers and researchers,** is a powerful, multifaceted tool for visualizing, manipulating, and understanding complex datasets. Based on Open Inventor® technology, Avizo is an ideal open framework for research centers, laboratories and consulting organizations. Wherever three-dimensional datasets need to be processed and analyzed, Avizo offers a comprehensive feature set within an intuitive workflow and easy-to-use graphical user interface. Packaged in different editions, Avizo meets your requirements for visualizing and analyzing seismic data to simulation data to materials structures.
Open Inventor®
For Application Developers

Open Inventor® is the premier solution for high-level 3D programming in all types of geophysics and geology applications. Whatever your visualization requirements are, Open Inventor saves you time and provides the features, performance and image quality you need to be successful.

Components for Application Developers
Open Inventor® is an object-oriented, cross-platform 3D graphics toolkit for the development of industrial-strength interactive applications using C++, .NET or Java. Open Inventor provides the power and functionality of OpenGL at an object-oriented level. Its easy-to-use API, its extensible architecture, and its large set of advanced components provide developers with a high-level platform for rapid prototyping and development of 2D/3D graphic applications.

State-of-the-art Volume Visualization
Open Inventor and VolumeVizLDM are revolutionary 3D visualization developer solutions to expand the frontiers of understanding for massive seismic data volumes (greater than several 100 GBs). Unprecedented rendering quality is available through the use of programmable shaders and direct GPU-based rendering. Multi-data support, such as data combining and transforming, can also be used to assist in understanding the true meaning of your data.

High Quality Rendering of Very Large Meshes
Open Inventor MeshVizXLM extension provides a complete set of tools for visualizing scalar or vector data fields defined on a 1D, 2D or 3D mesh. MeshVizXLM supports many types of regular and unstructured 2D/3D meshes, advanced representations for multidimensional data, fast, high-quality rendering techniques, high-level objects for axes and legend, and a broad range of chart representations to enhance output quality. MeshVizXLM handles very large meshes (more than 10 million cells) without duplicating application data.

Scalable and Remote Visualization
Using the ScaleViz extension, your application seamlessly scales up to use multiple GPUs, distributed rendering, high-resolution tiled display walls, and immersive VR environments. Remote visualization allows your application to render on a visualization server, located anywhere on the network, and display on remote client with high performance.

Performance and GPU Computing
The combination of the revolutionary performance of CUDA™ with the integration capabilities of the Open Inventor 3D API provides application developers with infinite possibilities for massive dynamic or static computation capabilities on seismic data with simultaneous 3D visualization feedback, leveraging the latest graphic board solutions to perform intensive parallel computation on the workstation.

Integration with your Environment
Careful design and flexible architecture allow Open Inventor to support a wide variety of development and deployment environments, making it easy to integrate into your environment – including application data structures, graphics, and user interface -. Open Inventor can be used with many different:

- Operating systems (including MS Windows, Linux, and UNIX)
- Programming languages (including C++, C# (.NET), and Java)
- User interface toolkits (including Qt, .NET, Wx, MFC, and Motif)
- Graphic boards

Open Inventor Users' Community
In addition to the direct benefits of using Open Inventor, users can also take advantage of direct interaction with an extensive community of users and VSG developers through our forum: www.openinventor.net
Avizo®
For Engineers and Researchers

Powered by Open Inventor®, Avizo is layered to optimize the environment for your specific needs. Avizo is packaged in different editions which deliver a tailored user interface and a specific feature-set for your application area.

Specialized Avizo Editions

Avizo Earth Edition
The Desktop Visualization Framework
The Avizo Earth Edition software is a versatile framework for integrating, manipulating, and visualizing seismic, geology, reservoir, and petrography datasets. Geophysicists and geologists use this solution to import, manage, interact with, and visualize multiple sources within a single environment.

Avizo Wind Edition
For Simulation Data
Avizo Wind is a high-end extensible software solution for advanced post-processing of simulation data, ranging from flow to thermal, and stress data. Avizo Wind brings an extensive array of advanced visualization and analysis tools to CFD and multiphysics, mechanical and thermal engineering, manufacturing simulation and microstructural prediction, non linear structural and geotechnical problems.

Avizo Fire Edition
For Core Sample Analysis and Materials Science
Major Oil & Gas companies, ranging from research centers to consulting organizations, use Avizo Fire to analyze their core samples or materials datasets obtained from data sources such as CT-scan, MRI, MicroCT, Synchrotron, and more.

All Editions Include:

Matlab® Bridge
Integrate complex calculus using Matlab® software from The Mathworks, Inc., by means of the Calculus Matlab module. Connect to your Matlab server from your Avizo session and execute Matlab computations directly on your Avizo session. Import and export Matlab matrices to and from Avizo, and export Avizo surfaces to Matlab surfaces.

Presentation, Sharing, and Reporting
- Mix images, geometric models, measurements and simulations
- Annotations, measures legends, histograms, and curves plots
- Advanced key frame and object animation
- Export spreadsheets, 3D models, images, and movies

Customize Avizo by Expanding it
Avizo’s expandability makes it an ideal open framework for research centers and consulting organizations that need software customization to address their specific application areas. Use the XPand extension to create new custom components for Avizo, such as file readers and writers. Integrate custom computation modules, and even new visualization modules, making Avizo a perfect tool for meeting your specific requirements.

Collaborative and Immersive Environments
Avizo provides advanced support for very high-resolution displays, VR systems, remote and shared work sessions, and visualization servers. Avizo XScreen extension allows for efficient multi-threaded rendering on multi-pipe systems or distributed rendering on a cluster system, using application level distribution. This approach offers optimal performance with minimal bandwidth requirements. Avizo Xteam extension allows for simultaneous and full collaboration on a shared project by synchronizing and sharing local sessions. Available from laptop to VR configurations, this high-level collaboration component addresses advanced needs in collaborative research projects.

Avizo Users’ Community
Join Avizo users’ community at:
www.avizo3d.net
High-performance 3D Visualization Software for Oil & Gas and Geosciences

3D visualization is valuable to many types of Oil & Gas and geosciences applications, such as developing leading-edge geostatistics software, seismic analysis software, or understanding fluid distribution if rocks.

For more information about examples of VSG’s 3D technology applications, visit our website at: www.vsg3d.com

ffA

SEA 3D Pro is ffA’s popular seismic image analysis plug-in for GeoProbe®.

Leveraging the GPU for computation via Open Inventor®’s shader-based capabilities has allowed ffA to create a very powerful, highly interactive workflow for Seismic Facies Analysis. The level of interaction achieved approaches real time, and provides geoscientists with the ability to analyze seismic facies and fine tune a classification result across a whole dataset rapidly, rather than having to generate multiple classified volumes on disk.

ffA will be taking this further in the future by moving their suite of sophisticated seismic image analysis algorithms to the NVIDIA® CUDA™ API, and bringing this together with CUDA-enabled Open Inventor® and VolumeViz SDKs to provide the next generation of data-driven seismic interpretation tool.

www.ffac.org.uk

Geovariances

Open Inventor is fully integrated into Isatis, Geovariances’ 3D viewer for geoscientists.

It offers sophisticated visualization abilities for in-depth data exploration and control in 3D. Data values and coordinates are instantaneously recovered from the Isatis database and displayed by clicking on the 3D graphic object to take faster and better decisions. Open Inventor allows for great flexibility in the representation (clipping along any 3D plane, flexible slicing, wireframes, iso-lines, iso-surfaces, transparency, stereoscopic view,…).

In order to face the increasing size of data volumes (e.g. seismic data), Isatis increasingly needs high-performance tools such as VSG’s new module MeshvizXLM.

www.geovariances.com

IFP

The Petrophysics Department at IFP selected Avizo to support some of their advanced research projects.

IFP conducts basic and applied research on experimental characterization and modelling of multiphase flow in porous media. The main objective is to understand and improve the assessment, development and exploitation of oil & gas fields, as well as developing CO2 geological storage methodologies and technologies.

The workflow that allows generating the pore network from 3D images involves a large set of image processing modules. The skeletonization module of Avizo is particularly suited to extract the essential features of the pore space geometry and topology. It provides a simplified network with a local measurement of the minimum diameter at each point of this skeleton. The mesh generation module is also integrated in the workflow, allowing the extraction and quantification of contacts surfaces.

Another benefit of Avizo is the multitude of image visualisation possibilities for an easy control of the various steps of the workflow.

www.ifp.com

Join a Partner Committed to your Success

Dedicated to serving our customers, VSG brings more than 20 years experience in 3D visualization.

Our Professional Services team is available to increase your efficiency through training, consultancy or custom development covering the whole life cycle of your project.

www.vsg3d.com