

# Avizo®

## The 3D Visualization Software for Scientific and Industrial Data

- Advanced 3D visualization and data analysis
- Increases understanding of complex datasets
- Manages complex multi-modality information
- Versatile and extensible architecture

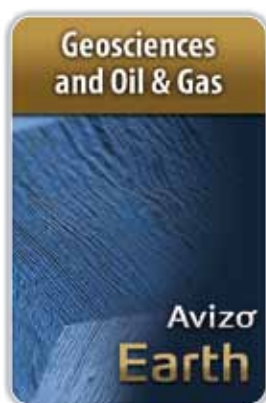
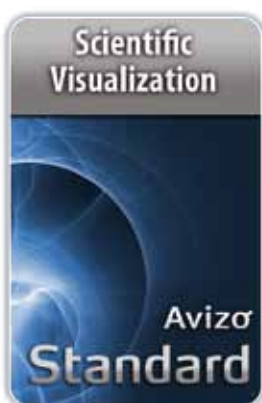


**Avizo® software is a powerful, multifaceted tool for visualizing, manipulating, and understanding scientific and industrial data. Wherever three-dimensional datasets need to be processed, Avizo offers a comprehensive feature set within an intuitive workflow and easy-to-use graphical user interface.**

Avizo's state-of-the-art features efficiently meet your specific requirements for 3D data visualization and analysis in scientific and industrial fields, such as material and physical sciences, geosciences, computer-aided engineering, environmental and generic scientific activities.

Avizo software suite is organized to maximize flexibility and configurability, making it an ideal visualization environment for a wide range of application types. Powered by Open Inventor® by Mercury, Avizo is layered to optimize the environment for your specific needs.

Avizo is packaged in different Editions, with optional eXtensions. Each Avizo Edition delivers tailored user interface and specific feature-set for each application area.



# Core Features

Avizo's comprehensive feature set addresses all aspects of 3D data acquisition, visualization, processing, analysis, and presentation.

## Advanced 3D Visualization

### Surface rendering

Yield even more meaningful and informative 3D visualizations using a large range of drawing styles and color schemes.

### Volume rendering

Perform direct visualization of 3D image data using a physically based light emission/absorption model.

## Scientific Visualization

### Flow data

Use advanced vector field visualization to display the results of flow simulation within the 3D model.

### Scalar, vector and tensor visualization

Display scalar data using isosurfaces, slicing and pseudo coloring. Visualize line integral convolution, stream lines, surfaces and ribbons. Take full advantage of built-in tensor visualization capabilities, such as iconic visualization of tensor fields, Eigenvalue extraction and rate-of-strain tensor computation.

### Point clouds/scattered data

Process arbitrary functional data given on a set of 3D points.

### Very large data

Process very large datasets (out-of-core) at interactive speed.

### Molecular data support

Visualize static molecules as well as trajectories. Compute and visualize configuration densities, secondary structures, hydrogen bonds. Flexible and fast ball and stick visualization, flexible color schemes.

### 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 data. Import and export Matlab matrices to and from Avizo, and export Avizo surfaces to Matlab surfaces.

## 3D Data Exploration and Analysis

### Viewing and navigation

Display single or multiple datasets in a single or multiple viewer windows, and navigate freely around or through these objects.

### Slicing and clipping

Quickly explore your 3D imagery looking at single or multiple orthographic or oblique sections. Clip away parts of your data to uncover hidden regions.

### Data analysis

Query the exact values of your datasets at arbitrary locations specified interactively. Plot or export the data for further processing with spreadsheet or plotting applications. Probing, measuring, counting, and other statistical modules quantify densities, distances, areas, volumes, and much more.

## Data Acquisition

### Data import

Load your data directly into Avizo. A large number of standard file formats are supported.

### Time-dependent data

Process single-time steps and time-series data such as a flow around a surface.

### Data manipulation and filtering

Simple and efficient 3D image manipulation is possible through a variety of digital filters, editors, and data processing modules.

## Image Data Processing

### Registration, fusion, alignment

Align and register multiple datasets for comparison, atlassing, or fusion. Fuse multi-modal data to increase the amount of information and the accuracy of your models.

### Image segmentation

Assign labels to individual pixels in the image data to identify and distinguish different structures for accurate 3D model generation and advanced data analysis tasks.

## 3D Reconstruction

### Geometric models

Employ innovative and robust algorithms from image processing and computational geometry to reconstruct high-resolution 3D images generated by CT or MRI scanners, 3D ultrasonic devices, or confocal microscopes.

### Surface reconstruction

Use innovative acceleration techniques to quickly perform surface reconstruction.

### Surface simplification

Adaptively reduce the number of triangles in a surface model for use on low-end machines or in web publishing using one of the most elaborate simplification algorithms on the market.

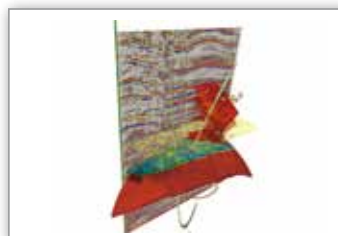
## Communication

### Presentation

Present the results of your work in the best possible quality and every state-of-the-art digital medium.

### Scripting

Use this easy way to customize Avizo and automate tasks without the need for C++ programming.



# Avizo Configurable Solutions

Select the edition and extensions that provide the best framework for your 3D data visualization and analysis needs.

## EDITIONS

### Avizo Standard

#### For Scientific Visualization

The Avizo Standard Edition for scientific visualization enables you to gain valuable, detailed insight into your scientific 3D data:

- Import any kind of scientific data through dedicated readers (2D/3D images, integration readers, measured/simulated data, time series).
- Explore your scientific data using the advanced scalar, vector and tensor visualization capabilities.
- Visualize simulation results either for pre- or post-processing using rich flow visualization and volumetric finite element generation (tetrahedra).
- Connect to a Matlab® server and execute computation scripts from your Avizo session.
- Handle molecular data, including trajectories, fields, computation of molecular surfaces, conformation analysis, and sequence alignment.
- Present and communicate your projects using built-in scripting, 2D/3D export, and high-quality movie generation capabilities.

### Avizo Earth

#### For Geosciences and Oil & Gas

The Avizo Earth edition is a versatile framework for integrating, manipulating, and visualizing your seismic, geology, reservoir engineering, and petrography datasets. Geophysicists and geologists can use this solution to import, manage, interact with, and visualize multiple sources within a single environment.

### Avizo Wind

#### For Simulation Data

Avizo Wind is a high-end extensible software 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

#### For Materials Science

The Avizo Fire edition offers a broad range of software tools for obtaining and visualizing advanced qualitative and quantitative information on materials properties and structure for industrial tomography, crystallography, material microstructure evolution, modality inspection for nanostructure, non-destructive investigation and surface analysis.

### Avizo Green

#### For Environmental Data

Avizo Green delivers a comprehensive feature-set dedicated to the visualization and analysis of climate, oceanography, volcanology or earth-mapped data.

## eXtensions

### XPand

Create new custom components for Avizo, such as file readers and writers, computation modules, and even new visualization modules, using the C++ programming language.

### XLVolume

Manage and visualize very large amounts of volume data of up to several terabytes. Go far beyond the limit of the available system memory. The multi-resolution technique used in XLVolume enables interactive visualization and navigation through large data sets.

### XScreen

Use Avizo's advanced data visualization and analysis features on immersive VR systems or tiled screens configurations.

It has built-in support 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.

Tracking capabilities enable a real immersive experience and interaction with the visualization.

### XTeam

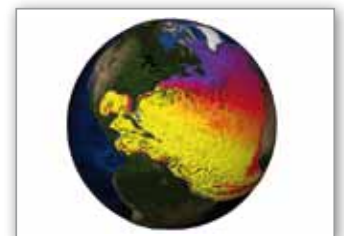
Multiple users can fully collaborate simultaneously on a shared project by synchronizing and sharing their respective local sessions. Available from desktop to VR/Cluster configurations, this high-level collaboration component addresses advanced needs in collaborative research projects.

### XSkeleton

Reconstruct and analyze dendritic and fracture networks. Specific micro-detailed image mosaics management is combined with advanced automatic and semi-automatic tools for reconstruction of images, such as a porosity network acquired through MRI, CT-scan, or other techniques.

### XReaders

Seamless import of all scientific and industrial data using a set of specialized readers: DICOM reader, Seg-Y reader, OpenSpirit Bridge, CATIA 5 and IGES / STEP readers, Madymo reader and Radioss reader.





# The 3D Visualization Software for Scientific and Industrial Data

Editions	Visualize to understand :
Avizo Standard	Scientific Visualization
Avizo Earth	Geosciences and Oil & Gas
Avizo Fire	Materials Science
Avizo Wind	Simulation Post-processing
Avizo Green	Environmental Data

## Avizo eXtensions

XPand	XLVolume	XScreen	XTeam	XSkeleton	XReaders
Develop custom modules	Very large data support	Multi-screen and VR	Share multiple sessions	Network reconstruction	Read CAD data

VSG also provides Open Inventor® by Mercury, a comprehensive, high-level 3D graphics toolkit for industrial-strength application development.

### Supported Platforms

- Windows® XP /Vista 32-/64-bit
- Linux® RHEL 4/5 32-/64-bit
- MacOS®X 10.5 32-bit

[www.vsg3d.com](http://www.vsg3d.com)



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