

# Open Inventor®

## 3D Graphics Toolkit for Industrial-Strength Application Development

- Speed up your application design, development and maintenance cycles
- Increase your performance with advanced 3D visualization and programming
- Protect your investment by abstracting low-level, underlying graphics technology
- Rely on advanced support of leading open standards



**Open Inventor® is an object-oriented, cross-platform 3D graphics toolkit for the development of industrial-strength, interactive, 3D graphics applications using C++, .NET or Java.**

Open Inventor® provides the power and functionality of OpenGL® at an object-oriented level. The easy-to-use API, extensible architecture, and large set of advanced components provide developers with a high-level platform for rapid prototyping and development of high-end, advanced 3D graphics applications.

Open Inventor® delivers enhanced productivity, performance, flexibility and reliability for development of your most demanding applications that require robust and evolutionary technologies to meet the highest challenges in 3D visualization.



# Core Features

## Object-Oriented 3D API

Open Inventor® offers a comprehensive object-oriented set (more than 1300 ready-to-use classes) integrated in a user-friendly framework for rapid development. The scene graph paradigm provides ready-to-use graphics programming patterns, and the object-oriented design encourages extensibility and customization to satisfy specific requirements. Open Inventor® is the most widely used scene graph API in the developer community.

## Optimized 3D Rendering

Open Inventor® has been tuned for improved performance by utilizing the latest relevant OpenGL® features and extensions, automatically taking care of OpenGL® optimization techniques to provide a much higher-level programming interface.

## Advanced Support of OpenGL® Shaders

OpenGL® shader rendering techniques can be applied to any Open Inventor® shape to further enhance the 3D visual experience by using special effects. Open Inventor® contains a library of more than 80 shader routines. ARB\_language, NVIDIA Cg and OpenGL Shading Language are fully supported.

## Advanced Development Help

IvTune® is an interactive graphical utility for tuning and debugging 3D applications as they are running. It allows the developer to interactively view and modify the scene graph.

## Comprehensive 3D Kernel

In addition to its complete 3D geometry kernel, Open Inventor® provides robust support of advanced 3D features, such as NURBS surfaces and collision detection. It also delivers full support of NURBS curves and trimmed surfaces with unlimited order, and allows for fast, efficient and crack-free NURBS tessellation. Open Inventor® also provides a fast collision-detection engine both between objects and between the camera and the scene, which prevents, for example, the camera from penetrating other objects in walkthrough type applications. This optimized collision-detection engine has proven to be efficient even on very complex scenes.

## Large Model Visualization

Open Inventor® can create new geometry with fewer triangles, and automatically generates LOD (level of detail) and appearance preserving simplification nodes to enhance performance and enable rendering interactively. It can convert geometry into more efficient triangle strips and reorder objects to minimize state changes. Fast editing of very complex scenes is also supported.

## Remote Rendering, VR Capabilities and Multi-Display

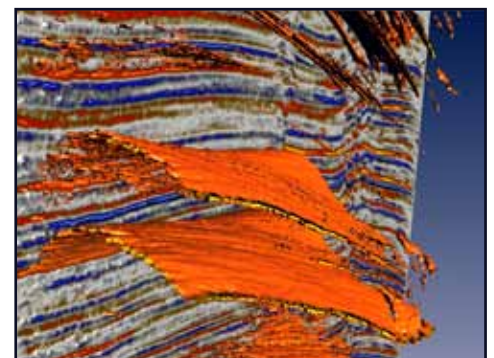
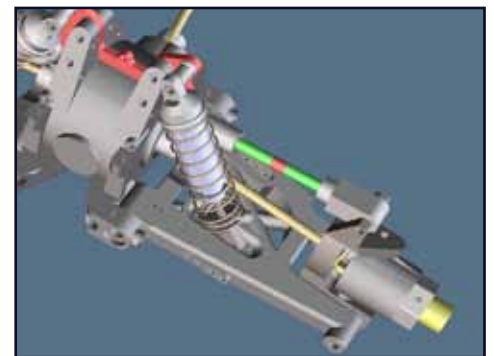
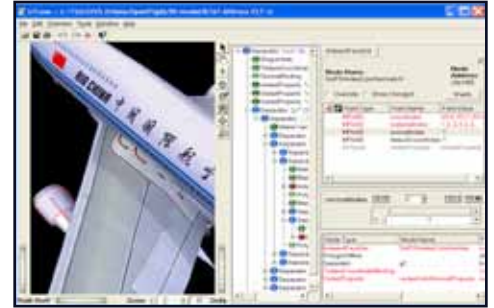
Open Inventor® provides high-level built-in components that deliver ready-to-use, robust solutions to common but thorny issues in 3D advanced applications development. You can keep up with cutting-edge techniques with less effort, including the performance optimization of next-generation of hardware that requires additional work with low-level APIs.

## Multithreading

Multithreading increases overall performance of an application by either making use of multiple processors or making better use of a single processor. This feature also enables the use of multiple graphics pipes, which can each have its own rendering thread.

## Computing Framework API

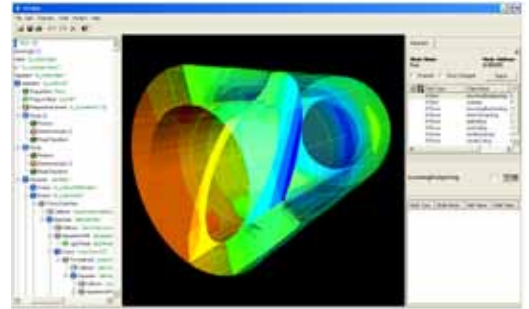
Open Inventor® provides full interoperability between display and computing. CPU, CUDA and OpenGL devices can be equally used to work with geometry or any data, delivering a unique development framework to integrate synchronous high-performance computation tasks within an interactive 3D graphics application.



# Customization through Extensions

The Open Inventor® package includes a complete suite of extensions that make customization easy for specialized markets or unique application needs.

Through unique innovative technologies, the Open Inventor extensions give you access to the latest 3D visualization techniques: Large Data Management for volume rendering, ultimate scalability through rendering distribution and remote application, advanced 2D/3D scientific visualization technologies, realistic ray-traced rendering, and more.

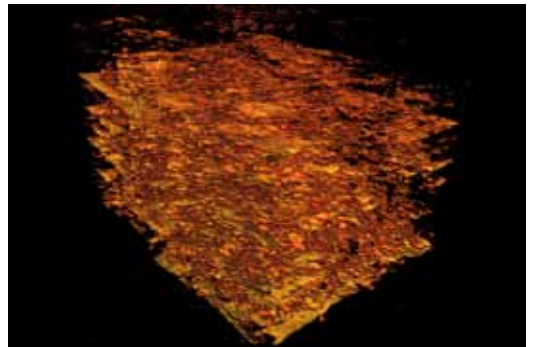


## VolumeViz Extension

VolumeViz enables interactive visualization of very large datasets. Volume rendering, slicing, iso-surface extraction and embedded 3D geometry can be combined in a single Open Inventor-developed application.

VolumeViz supports multiple datasets 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.

The VolumeViz LDM option delivers even greater performance by offering out-of-core data management capabilities which allows both visualization and computation to be performed on very large datasets encompassing hundreds of Gigabytes.



## ScaleViz Extension

ScaleViz is a set of breakthrough technologies which implement rendering distribution on clusters and multi-GPU configurations along with scene and image compositing to solve the most challenging demands in visualizing very large datasets at interactive frame rates. To deliver optimized, distributed visualization solutions, ScaleViz implements the following advanced strategies:

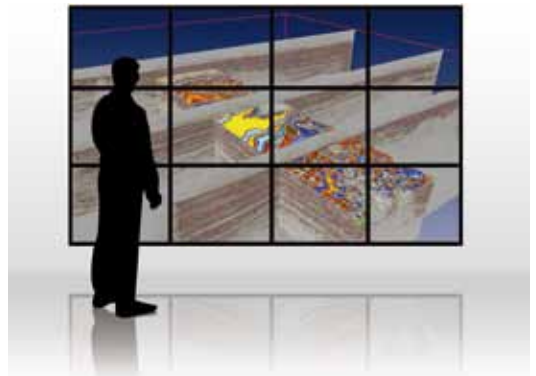
Tiled Display increases resolution while delivering the best performance.

Tile Compositing accelerates resolution-dependent performance.

Depth Compositing accelerates data-dependent performance.

Remote Application uses visualization servers to visualizes huge amounts of data remotely.

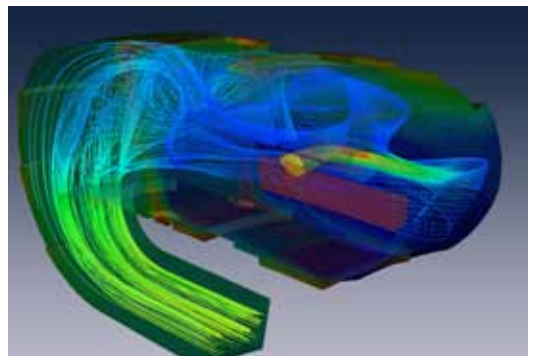
From a fish tank display to a fully immersive and collaborative environment, ScaleViz fits it all.



## MeshViz Extension

MeshViz is a high-level data visualization component designed for scientific, manufacturing, finite element, fluid dynamics, and reservoir engineering visualization applications.

MeshViz provides advanced representations for multidimensional data and fast, high-quality rendering techniques and supports any type of regular and unstructured 3D/2D meshes from CAE, FEA, CFD and Reservoir Engineering applications. It also provides a full feature-set for high-level axes, legends and charting representations. The MeshViz XLM option, available for Open Inventor® C++, delivers even higher performance by providing a unique Advanced Virtual Programming Interface, which enables the support of any type of mesh and dramatically reduces memory consumption, enabling support of very large meshes (> 10 Million cells)



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### DirectViz Extension

DirectViz allows Open Inventor® applications to visualize 3D scenes with very high realism and scalability by using the OpenRTRT real-time ray-tracing engine as an alternative to OpenGL.

DirectViz addresses demanding needs currently out of reach of graphics processors and OpenGL, in styling and conceptual design, virtual prototyping, and visual simulation.

### HardCopy Extension

HardCopy allows applications to output graphics as PDF-3D documents, and in several vector formats such as CGM, HPGL, PostScript, and GDI/EMF.

Unlike rendered images, these formats provide high-quality, resolution-independent output suitable for large format plotters, yet with high performance even on complex scenes.

### Data Converter Extensions

Data Converter Extensions provide integrated capabilities for converting various CAD/CAM file formats to Open Inventor® file formats. These extensions allow developers to add sophisticated import capabilities to their existing applications.

Data Converter Extensions are available on Windows®, Linux® and UNIX®. Customers working in CAD/CAM areas can also use the software in batch processing mode. Several input data formats are available: IGES 5.1, VDA-FS (automotive profile), STL ASCII (prototyping), DXF R14 (3D Solid not supported), Catia v5.

### Specifications

#### Supported Platforms C++

- Windows XP/Vista 32 2005(VC8) / 2008 (VC9)
- Windows XP/Vista 64 2005(VC8) / 2008 (VC9)
- Linux 32 RHEL 4 (gcc 3.4.3) / RHEL 5 (gcc 4.1.1)
- Linux 64 RHEL 4 (gcc 3.4.3) / RHEL 5 (gcc 4.1.1)
- Solaris 8 32 / 64 – STL4 Port

#### Supported Platforms .NET

- Windows XP/Vista 32 2005(VC8) / 2008 (VC9)
- Windows XP/Vista 64 2005(VC8) / 2008 (VC9)

#### Supported Platforms Java

- Windows XP 32 2005(VC8)
- Linux 32 RHEL 5 (gcc 4.1.1)
- Linux 64 RHEL 5 (gcc 4.1.1)
- Solaris 8 64
- Sun Solaris 9

#### Other Platforms

Contact us for details.