MATHEMATICA®
DYNAMIC VISUALIZER

3D GRAPHICS IN REAL TIME

Dynamic Visualizer is a powerful real-time graphics extension to *Mathematica*. It lets users graphically simulate systems that range from simple harmonic motion and chaotic behavior to planetary systems. Using revolutionary algorithms in software rendering, *Dynamic Visualizer* allows users to create three-dimensional graphics previously available only through expensive specialized software.

Three-dimensional objects and animations created in *Mathematica* can be transformed interactively in *Dynamic Visualizer*.

Using *Mathematica*'s *MathLink*® protocol, objects created in *Mathematica* are displayed in *Dynamic Visualizer* where they can be scaled, rotated, and textured. With both still and animated texture mapping available, you can map textures created in *Mathematica* onto objects in *Dynamic Visualizer*. Objects can be rendered as wire frames or as flat or smooth Gouraud shades. For even more realistic rendering, *Dynamic Visualizer* allows users to adjust the ambient lighting, diffuse and spectral reflectivity, and transparency of an object in real time.

KEY BENEFITS

- *Dynamic Visualizer* works with all standard *Mathematica* graphics commands, such as ParametricPlot3D, Plot3D, and Graphics3D.
- All transformations can be programmed in *Mathematica* or performed interactively using *Dynamic Visualizer*.
- *Dynamic Visualizer*'s intuitive interface lets users easily modify an object's properties, such as color or texture.
- *Dynamic Visualizer* documents and supports its own simple ASCII file format.
- Animations can be created and exported as QuickTime® or AVI movies.

For more information, visit **www.wolfram.com/visualizer**.

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Dynamic Visualizer brings high-quality three-dimensional graphics to your *Mathematica* projects interactively and in real time.

Dynamic Visualizer Features

Object Transformations
Translation ▪ Location ▪ Rotation ▪ Scaling

Lighting Properties
Light source positioning ▪ Ambient lighting ▪ Diffuse and specular reflectivity ▪ Transparency

Surface Rendering
Point clouds ▪ Wire frames ▪ Flat polygons ▪ Smooth Gouraud shaded polygons

Animations
Rotate ▪ Tilt ▪ Fly past ▪ Corkscrew ▪ *Mathematica* kernel animations ▪ Export QuickTime and AVI movies

Dynamic Visualizer Functions List

Getting Started
VisualizerPalettes ▪ ClearVisualizer ▪ QuitVisualizer ▪ QuitExternalApplication

Creating Objects
Visualize ▪ CreateObject ▪ Object3D ▪ Model3D ▪ Camera ▪ VisualizerUniverse ▪ DestroyObject ▪ $LastVisualizerObject ▪ $DefaultModel3D ▪ ModelRange ▪ VisualizerShow ▪ EquivalentViewPoint

Manipulating Objects
SetOptions ▪ Opacity ▪ Specular ▪ Ambient ▪ Diffuse ▪ Visible ▪ InteractiveMovement ▪ RenderMode ▪ TransformationMatrix ▪ ScaleInvariantPoint ▪ Color ▪ YawPitchRoll ▪ EulerAngles ▪ PointCloud ▪ AxisAndAngle ▪ Location ▪ Wireframe ▪ FlatShaded ▪ SmoothShaded ▪ LocateObject ▪ TranslateObject ▪ CoordinateReference ▪ BoundingBox ▪ EquivalentTransformationMatrix

Creating Animations
ExportVisualizerAnimation

Object Lists and Tests
VisualizerObjects ▪ VisualizerObjectQ ▪ $SelectedVisualizerObjects

Package Properties
$VisualizerLink ▪ $VisualizerVersion ▪ $VisualizerVersionNumber

Advanced Options
StartVisualizer ▪ ConnectVisualizer ▪ LaunchVisualizer ▪ ApplicationName ▪ ConnectionName ▪ $VisualizerStartUpCommand ▪ $AutoStartVisualizer ▪ $VerboseMessages ▪ $StartVisualizerOptions ▪ $VisualizerApplicationName ▪ $PreVisualize ▪ $VisualizerTimeout ▪ $SystemDisplayFunction

General *Mathematica* Features

Over 1900 built-in functions, including the world's largest collection of advanced algorithms for numeric and symbolic computation, discrete mathematics, statistics, data analysis, graphics, visualization, and general programming

Multi-paradigm symbolic programming language with support for procedural, functional, list-based, object-oriented, and symbolic programming constructs

Automatic precision control and support for exact integers of arbitrary length, rationals, floating-point real and complex numbers, and arbitrary-precision real and complex numbers

User-defined or automatic algorithm selection for optimal performance

Fully programmable 2D and 3D visualization with over 50 built-in plot types

Fully integrated piecewise functions

High-speed numerical linear algebra with performance equal to specialized numeric libraries

High-performance optimization and linear programming functions

Wide-ranging support for sparse matrices

Flexible import and export of over 70 data, image, and sparse matrix formats

Industrial-strength string manipulation

Highly optimized binary data I/O

Built-in universal database connectivity

Integrated web services support

Language bindings to C, Java, .NET, and scripting languages

MathematicaMark™ benchmarking tool

Toolkit for creating graphical user interfaces

Technical Requirements

Dynamic Visualizer requires *Mathematica* 5 or later and is available for Windows.

Related Products

The *Mathematica* Applications Library is a continually expanding collection of software used in conjunction with *Mathematica* to quickly handle specific tasks in engineering, finance, data analysis, and many other technical areas.

Some of the software packages available are:
Control System Professional ▪ *Advanced Numerical Methods* ▪ *Wavelet Explorer* ▪ *Time Series* ▪ *Experimental Data Analyst* ▪ *Digital Image Processing* ▪ *Mechanical Systems*

Find the latest products and buy online throughout the world at **store.wolfram.com**. Choose from over 50 technical software products, more than 200 books, *Mathematica* posters, T-shirts, and other items.

For more information, visit **www.wolfram.com/visualizer**.

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