

Product Information

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GeoShow3D

Product Features



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1 Introduction

The following products, all based on our GeoShow3D technology, have been specially designed to match the different needs of our wide range of customers:

- **Lite**
This is the free of charge viewer (freeware) for end-users.
- **Publisher**
This is the software that allows editing existing terrains (update information and add new features, etc.)
- **Pro**
This is the application which enables the user to create and edit terrains.
- **Terrain Server**
This is the application that serves terrain data via the internet for visualization in real-time.
- **Image Server**
This is the application that serves terrain data via the internet on a frame by frame basis.

1.1 Lite

GeoShow3D Lite is GeoVirtual's viewer of dynamic 3D cartographic files in our .gs file format. It is a very powerful application which enables users to freely navigate over complex high resolution multi-layer aerial image based terrain. It includes a wide variety of functions and is very user-friendly.

Currently we can offer simple personalization of the interface, in that we can change the splash screen, the "about" dialog and the logos. Another personalization we can offer consists of the availability of certain features. At the beginning of the next year we can offer a completely personalized version of the graphical user interface.

At this moment, GeoShow3D Lite is available for Windows 98 and up. It uses DirectX. Linux will be supported by the end of the year, and the use of DirectX will be replaced by OpenGL.

1.2 Publisher

GeoShow3D Client is the application which we recommend for all professional users whose work involves the communication of territory-related features. Such features can be edited using this software and multimedia content can be easily incorporated into any image based terrain created using GeoShow3D Pro. This software also includes a module to produce high quality videos. The user is not required to have professional level cartographic knowledge.

It includes all the functionalities of GeoShow3D Lite. It is not possible to create a new project using GeoShow3D Publisher, or import digital terrain models or layers. This should be done with GeoShow3D Pro.

1.3 Pro

GeoShow3D Pro is the professional application required to create 3D image based terrains from 2D cartographic data and digital terrain models. This software is an efficient tool for professional users well accustomed to processing cartographic data.

It includes all the functionalities of GeoShow3D Publisher.



2 Features

The following paragraphs describe all features available in the various versions of GeoShow3D. Note that most features can be used in all versions, but the definition of the content can only be done using GeoShow3D Publisher or Pro.

2.1 Real-time Visualization

GeoShow3D allows real-time visualization of huge terrains in 3D in its proprietary file format, even on normal home computers. This is possible due to the fact that it just uses the minimum amount of data that is really necessary to display the terrain. Parts that are not visible, as well as terrain details that are not distinguishable given a certain view, are simply not loaded. This technology uses multi-resolution data structures and related data handling techniques to achieve this. If a part of the terrain is far away, it suffices to display just a low-resolution representation of that part, which takes a lot less memory and processing than the original high-resolution counterpart.

It seamlessly displays multi-resolution geometry and imagery data that make up the terrain, and performs automatic on-demand paging or downloading of these data. It uses Continuous Level Of Detail (CLOD) terrain rendering for optimum performance and optimum geometric quality at any level of detail.

The user can control the quality versus performance balancing for both geometry and imagery. He can also control settings for the graphics card, frame rate (typically 25 fps), and more.

GeoShow3D can visualize overlapping and blended raster layers, up to 8 layers at the same time (depending on the graphics card).

Whether the application visualizes 3D terrains located on the local computer or on the internet is transparent for the user. The performance is the same in both cases, only the time it takes to reach the same quality of geometry and imagery will differ, depending on the speed of the internet connection.

2.2 Terrain

A 3D terrain basically consists of an elevation grid (defined by a digital elevation model or DEM), which is covered by one or more image layers (raster data).

Terrains can be viewed by all versions of GeoShow3D, but can only be created by GeoShow3D Pro.

1.2.1 Elevation

Elevation data can be imported from various file formats. Only regular grid formats are supported. During the import process, the data are converted into an internal format that is optimized for real-time visualization. If required, the data can be compressed.

Supported import formats:

- Arc/Info ASCII (.asc;.txt)
- ESRI Labeled BIL (.bil)
- RAW (.aux)
- DTED (.dt0)
- Tiff/GeoTiff (.tif)
- DEM (.dem)
- FITFiles (.fit)
- World files (.tfw;.bpw)

1.2.2 Layers

Raster layers can be imported from various file formats. During the import process, the data are converted into an internal format that is optimized for real-time visualization.



The number of layers that can be defined in a project is not limited, although the number of layers that can be visualized at the same time is limited by the graphics card (up to eight). The user may select any combination of layers for visualization.

A layer may be defined as semi-transparent (blending the layer with the layers below it), and may have a key-color transparency. Other optional features that can be specified during import are compression and optimization for use over the internet.

Supported import formats:

- Jpg (.jpg)
- Bitmap (.bmp)
- Png (.png)
- Gif (.gif)
- Erdas Image (.img)
- ESRI Labelled BIL (.bil)
- USGS DOQQ (.doq)
- Tiff/GeoTiff (.tif)
- FIT (.fit)
- PCI Aux (.aux)
- GXF (.gxf)
- CEOS (.img)
- Ecw (.ecw)
- World Files (.tfw;.jgw;.bpw)

2.3 Attributes

The term attributes is used to cover toponyms, information points and views.

1.3.1 Toponyms

Toponyms are text labels and image labels that indicate a certain location on the terrain. They are organized into categories. They fade out at a user defined minimum and maximum distance to avoid cluttering and obscuring information.

Their appearance (text font, size, color, custom image) is defined for a whole category at once, but can be overridden for each individual toponym.

Toponyms can be viewed in all versions of GeoShow3D, and can be defined in GeoShow3D Publisher and Pro.

1.3.2 Information Points

Info-points are 3D models placed on the terrain indicating a point of interest. They are organized into categories. They fade out at a certain user defined maximum distance to avoid cluttering.

Their appearance is defined for a whole category at once, but can be overridden for each individual information point. The 3D model representing the information point can be one of the standard models provided by the application (cube, pyramid, cone, cylinder, globe or donut), or a customized model (building, statue, road, airplane, windmill, etc). The 3D models may be animating.

Multimedia information (text, image, video, website, etc) can be linked to the info-point in the form of a url pointing to a file or a website, that will be shown when the user clicks on the 3D model.

3D models can be exported from 3D Studio Max using a special plug-in that comes with GeoShow3D Pro.

Info-points can be viewed and consulted in all versions of GeoShow3D, and can be defined in GeoShow3D Publisher and Pro.

1.3.3 Views

A view defines a fixed camera position and orientation. When selecting a view, the automatic pilot will fly you to this position.



Views can be selected in all versions of GeoShow3D, and can be defined in GeoShow3D Publisher and Pro.

1.3.4 Import / Export

Attributes (toponyms, info-points and views) can be imported or exported from and to a Microsoft Access database, or a proprietary file format that allows copy protection of the data.

Import and export can be used in GeoShow3D Publisher and Pro.

2.4 Navigation

1.4.1 Free Flight

The user can navigate freely over the terrain changing camera position and orientation (position, altitude, course, inclination and roll), using keyboard, mouse, joystick, game-pad and other input devices.

It is possible to fly at constant altitude (moving forward, backward, left and right) or following the camera viewing direction (possibly going up or down). It is also possible to move up and down vertically.

Another intuitive way to fly freely is by clicking with the mouse on the screen and dragging the mouse in the direction you want to go. The camera will follow the mouse fluently.

The user can define the flying speed, and set an option to make the flying speed depend on the current altitude. This latter option gives a more useful as well as natural feeling during navigation. Also, the user can limit the flying height to a minimum depending on the resolution of the raster layers, to avoid seeing the individual pixels of the terrain.

Free flight navigation is available in all versions of GeoShow3D.

1.4.2 Guided Tours

A guided tour consists of a flight path that is followed by the automatic pilot. During the flight, background audio (music or voice-over) is played. At previously defined locations, multimedia information is presented to the user (text, images, video, audio, websites or any document you can view on your computer).

Guided tours can be played in all versions of GeoShow3D, and can be defined in GeoShow3D Publisher and Pro.

1.4.3 Click-and-Go

By clicking on the label of a toponym or by clicking directly on the terrain surface, the automatic pilot will fly you to that location. It is also possible to click on the overview map to go directly to a location (see the corresponding paragraph).

This option is available in all versions of GeoShow3D.

1.4.4 Automatic search

An automatic search facility exists for toponyms, info-points and fixed coordinates.

Categorized lists can be displayed for both toponyms and info-points. Clicking one of the names in such a list will activate the automatic pilot, which will fly you to the selected location. It is also possible to type the name of a toponym or info-point directly, in which case auto-completion of the typed name is performed to facilitate

The user can also directly type the location and/or orientation for the camera. The camera view will change directly.



This option is available in all versions of GeoShow3D.

1.4.5 Views

A view defines a fixed camera position and orientation. When selecting a view, the automatic pilot will fly you to this position.

Views can be selected in all versions of GeoShow3D, and can be defined in GeoShow3D Publisher and Pro.

1.4.6 Overview map

An overview map is a 2D map of the terrain, which is displayed in a separate window. On this map, the current camera position and orientation is indicated. Moving the mouse over the map will also show the corresponding coordinates. It is possible to click on the map to instantly change the location of the camera ("click-and-go").

The overview map can be consulted in all versions of GeoShow3D, and can be defined in GeoShow3D Pro.

1.4.7 Coordinate Display

At all times, the geo-referencing information of the camera is displayed (coordinates and height).

Coordinates can be displayed in UTM or geographic coordinates, and in various datums. Display of height information can be done relative to the Mean Sea Level or to the reference ellipsoid.

Coordinate display is available in all versions of GeoShow3D.

1.4.8 GPS

It is possible to connect a GPS device to GeoShow3D. A 3D model will indicate the position, orientation and movement of the GPS. A GPS log is generated automatically, and it is possible to playback such a log at a later time without the need to connect the GPS.

Various options are available for GPS playback (path interpolation, stick to surface, playback rate, model size, etc).

This option is not available in the standard releases of the GeoShow3D products.

2.5 Tools

1.5.1 Video

Videos can be created in AVI format, using any installed video codec. The user defined a flight-path that can be previewed and saved as video. The flight-path can be recorded automatically during user navigation, or individual key-points can be marked and turned into a flight-path. It is also possible to transform previously defined views into a flight-path.

This option is only available in the versions Publisher and Pro.

1.5.2 Measurement tools

Tools are available to query the coordinates and height of a certain location on the terrain, and to calculate distances, profiles, areas and perimeter lengths. The user can draw the spot, track or area to be measured on the terrain by simply clicking on its surface.

The following measurement options are available:

- **Position**
This option displays the coordinates and the elevation of the indicated location.



- **Distance**
This option displays the aerial distance, flat distance, elevation difference, and the minimum, maximum and average gradient of the indicated path. The distance is measured in straight lines, independent of the surface.
- **Profile**
This option displays the profile length, flat distance, elevation difference, and the minimum, maximum and average gradient of the indicated path. The distance is measured following the surface of the terrain.
- **Area**
This option displays the area, perimeter, flat area and flat perimeter of the indicated area.

Measurement tools are available in all versions of GeoShow3D.

1.5.3 Overview Map

An overview map is a 2D map of the terrain, which is displayed in a separate window. On this map, the current camera position and orientation is indicated. Moving the mouse over the map will also show the corresponding coordinates. It is possible to click on the map to instantly change the location of the camera ("click-and-go").

The overview map can be consulted in all versions of GeoShow3D, and can be defined in GeoShow3D Pro.

1.5.4 Legend

A legend is an image explaining the visible terrain colors and features, and is displayed in a separate window.

The legend can be consulted in all versions, and can be defined in GeoShow3D Pro.

1.5.5 Snapshots

The user can take a snapshot of the current view. It can be saved as a bmp or jpg file. It can also be printed, or send by e-mail.

This option is available in all versions of GeoShow3D.

1.5.6 Marking locations

The user can mark a location with an arrow in the 3D scene with a simple mouse-click. This facilitates communication with other users in combination with the option to send a snapshot by e-mail.

This option is available in all versions of GeoShow3D.

2.6 Online

Terrain files can be published over the internet using GeoShow3D Terrain Server. GeoShow3D applications access the server using a proprietary communications protocol for optimum performance, which is mounted over HTTP for optimum compatibility with firewalls and proxy servers.

Special compression and data administration techniques are used to minimize the amount of information to be downloaded, allowing good quality visualization without long waiting periods. Persistent caching of the downloaded data avoids the need to download information more than once. The data remains available between sessions.



Whether the application visualizes 3D terrains located on the local computer or on the internet is transparent for the user. The performance is the same in both cases, only the time it takes to reach the same quality of geometry and imagery will differ, depending on the speed of the internet connection.

Viewing online terrain files is possible with all versions of GeoShow3D.

2.7 Publishing

Once a project is completely build, GeoShow3D Pro can compress and bundle all the data into a single distributable file (.gs file), that can be read by GeoShow3D Lite, Client and Pro. This file cannot be modified, nor can the data be extracted. This allows for a safe method of distribution of copyrighted material, since the data can only be viewed with GeoShow3D.

Multimedia- and other documents referred to by info-points are not included in this file, but are collected into a separate media folder, and should be distributed together with the .gs file.

Publishing can only be done with GeoShow3D Pro.