Revli Application User's Guide

This document provides instructions for using Revli, an example medical application by Real Time Visualization. Revli is included on the distribution CD-ROM. It runs only only on Windows NT platforms.

Introduction

Revli is a demonstration suite that provides a representation of how images appear when developers integrate the VolumePro 500 with real applications. Revli is a series of different images and data sets which show the type of performance one may see when the VolumePro 500 is installed in a PC desktop system.

The main window of the Revli application has a menu bar at the top, parameter settings on left, and a volume display screen on right. At the bottom of the volume display screen is a graph of the color lookup table that is used in the render.

Requirements

To run Revli, your system requires the following:

- The VolumePro board and software installed.
- A 3-button mouse (Revli uses mouse-button shortcuts to move the volume and the 3D cursor).
- The monitor's color depth setting should be set to True Color, and its resolution should be set to 1280 x 1024. On Windows NT systems, these can be set by going to the Control Panel, selecting Display, and choosing the Settings menu tab.

Menu Bar

The menu bar includes the File command, which includes the following options.

New

Open a new Revli window.

Open

Open opens a volume data file in the rendering window. Revli accepts volume data files with .SLC, .VOX, or .MVOX suffixes. (See "4D Volumes" for more information about MVOX files.) Sample volume data files are in the \data VolumePro subdirectory. You can also use Open to open a color lookup table file, identified by a .CLUT suffix.

Save, Save As

Save and Save As save the current color lookup table to a.CLUT file.

Close

Close closes the current window. If that is the only window open, Close also exits the application.

Exit

Exit exits the application and close all windows that are open.

Parameter Settings

The left side of the main window contains the volume rendering parameter settings.

Press the Tab key to highlight the text entry boxes for the parameter settings. Parameters include the following features, which are also described in the *Volume Library Interface User's Guide*.

3D Cursor

Options include enabling the cursor, setting it to line or plane format, and setting its position, opacity, and thickness.

Box Cropping

Parameter settings include the minimum and maximum values of the X, Y, and Z cropping slabs; clicking on the Change box enables classification with that slab. Clicking on the arrow buttons either grow or shrink the size of the cropping slabs; as you click on the arrow buttons the minimum and maximum values will change.

Supersampling

The parameter settings include supersampling in the x-, y-, and z- directions.

Cut Plane

The parameter settings include the following:

- Enable - enable cut plane
- Animate - cycle cut plane through a series of preset values
- Half Space - sets cut plane thickness to a large value, so that the entire half space is displayed
- Attach to Volume - if checked, cut plane moves with volume if volume is rotated; otherwise, the cut plane remains stationary when volume moves
- Reset Origin - set cut plane origin to the volume origin
- At Cursor - set cut plane origin to location of the 3D cursor, which must be enabled

Lighting

Options include lights from several directions:

- Top Left
- Bottom Left
- Top Right
- Bottom Right
- Headlight (points straight into the screen)

Other parameter options include

- Light Intensity
- Material properties: Diffuse, Specular, and Emissive components
- Shininess (Specular Exponent).

Blend Mode

Choose one of the following blending modes: Front-to-back, MIP, or MinIP.

GMOM/GMIM

Choose whether to modulate opacity or lighting.

4D Volumes

Use this set of options to run a 4D, animated file, which is specified by the .MVOX extension. MVOX files are essentially text files that specify multiple .vox format datasets.

Select Animate to run the .mvox file. Next Volume and Previous Volume display individual .vox datasets within the volume. You can also set the speed at which the .mvox file is played.

Transfer Function

This set of options controls the color and opacity values that are used with the volume. Options include

- Setting the window and level values: the window is one-half the width of the opacity value ramp -- the value from one end of the ramp to the midpoint. The level is the midpoint of the ramp. Altering the window and level values changes the "layers" of the volume that are displayed. If you check the Use Window/Level option, you cannot change the values in the transfer function shown at the bottom of the volume display window.
- Make Greyscale LUT installs a greyscale ramp color lookup table
- Make Default LUT installs a color lookup table with default values.

Momentum

Momentum sets volume moving when you click left mouse button & drag on volume. Click left mouse button again, or uncheck Momentum option, to stop.

Bounding Box

Bounding Box displays the boundaries of the volume in the x, y, and z directions.

Histogram Log Plot

Histogram Log Plot plots a histogram according to transfer function; makes small details more visible.

Add Embedded Pointer

Add Pointer adds an OpenGL pointer at current position of 3D cursor, which must be enabled.

Remove Pointer

Removes the OpenGL pointer.

Volume Display Window

The volume display window provides several mouse and keyboard shortcuts that control the rendering features or the view of the volume:

Window and level controls

To change the window, press middle mouse button & drag mouse side-to-side.

To change the level, press middle mouse button & drag mouse up-and-down.

Cut plane

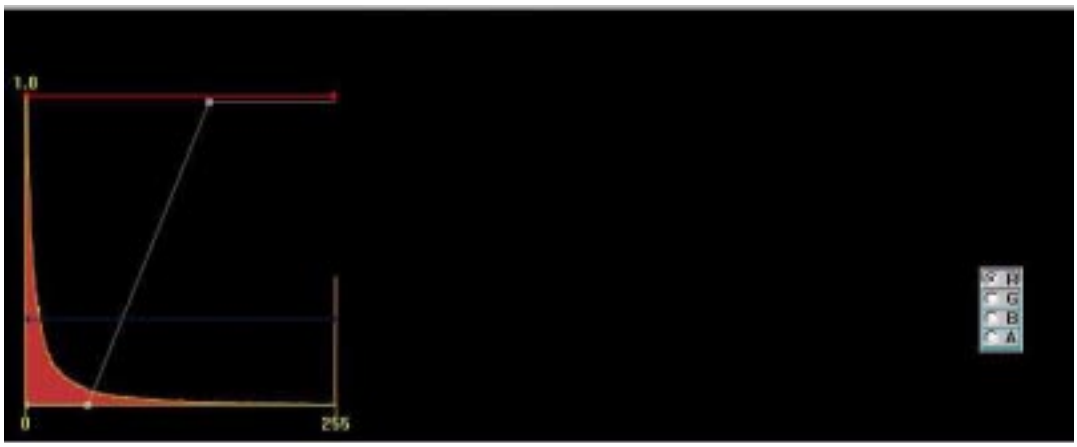
Change normal vector (cut plane orientation): press Shift key & left mouse button at the same time.

Change thickness: press Shift key & middle mouse button at the same time.

Change distance D (cut plane position): press Shift key & right mouse button at the same time.

Color lookup table

The transfer function at the bottom of the volume display window graphs the red, green, blue, and alpha values of the color lookup table.



To add a point, double-click the left mouse button where you want to add it.

To delete a point, move the mouse pointer over the point and press the right middle mouse button.

To move an existing point, click on the point and drag with left mouse button.

Zoom

To zoom in and out of the volume, press left & middle mouse buttons at the same time while dragging mouse up and down.

Rotate

To rotate volume, click left mouse button and drag.

Momentum

This option spins the volume continuously. Check Momentum box (at bottom of Parameter settings on left), hold left mouse button and drag. To stop, click left mouse button or uncheck Momentum box.

Default Views of Volume

The F1 - F7 function keys provide default views of the volume. The mouse pointer must be in the volume display window (click on window to do this):

Xmin = F1 key ; Xmax = F2 key

Ymin = F3 key; Ymax = F4 key

Zmin = F5 key; Zmax = F6 key

oblique = F7 key

Error Messages

Revli displays VLI error status messages in a Windows dialog box.