Collaborative Volume Visualization Using VTK
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Collaborative Scientific Visualization Environment

CSVE is a basic collaborative scientific visualization environment that was developed under a National Science Foundation (NSF) MRI grant and NSF REU Supplement to the grant, 0215583, during FY2002. CSVE was demonstrated in a prototype collaborative scientific visualization of time-dependent data sets. Developed using the Java programming language and the Visualization Toolkit (VTK), this environment allows any group of scientists on a network sharing the same interface and visualizations to explore simulations of different scientific/natural processes, to interactively roam and zoom an array of time-dependent data sets, and to interact in other ways, e.g. using a chat utility, whiteboard, streaming audio, streaming media, or the graphics screen just as if sitting together in front of the same workstation.

3DS Data Session

This type of data session enables the users to share files in .3DS format and allows for collaborative exploration of the object as it is rotated, translated, enlarged, or deleted by other users. The current version of the CSVE also supports surface as well as the wire frame representation of objects in the scene.

Three-Dimensional Data Session

Creating Custom Cross Sections

When the session for viewing data of a human head is entered it is possible to create cross sections which represent a color map on a rectangular object.

The total of three types of cross sections are possible: axial, sagittal, and coronal, each being parallel to the z, x, and y axis, respectively.

The graphical user interface shown above allows setting the following parameters of the cross section:
- cross section extent, range of possible values, color parameters, and a name.
- The Apply button sends the image to all the participants currently in the session and the object is added to the list of existing components in the scene.

Creating Custom Isosurfaces

Given a single value, it is possible to create a corresponding isosurface object as well.

The following parameters customizable by the user besides the contour value and the name: RGB color, Lighting and Specular power, Transparency, and the ambient parameter.

The Manage Components window of Visualization Frame the displays all existing components and allows for their modification.

If the preset isosurface set up is selected, the user is only required to set the contour value of the object and the name.