Data analysis with ParaView 3.4.0

CSMP Workshop 2009
Gillian Gruen
How to ...

... display a data set (→ Contour, Glyph, Clip, Slice)
... be efficient in displaying similar data sets
   (→ work with „Lookmarks“)
... create streamlines
... plot over a line
... plot over time
... interface to other programs (e.g. SigmaPlot)

→ Workflow / Tricks&Pitfalls / Settings
Overview: User Interface
View Control

- View directions:

- Default movement control settings:

  - Visibility: select the right view before!
Displaying (similar) data sets

**Contour** filter: Generate isolines or isosurfaces using point scalars.

**Glyph** filter: This filter generates an arrow, cone, cube, cylinder, line, sphere, or 2D glyph at each point of the input data set. The glyphs can be oriented and scaled by point attributes of the input dataset.

**Smooth** filter: Smooths a polygonal surface by iteratively moving points toward their neighbors.

**Clip/Slice** filters: Clip with an implicit plane. Clipping does not reduce the dimensionality of the data set. The output data type of this filter is always an unstructured grid. Slicing is similar to a contour. It creates surfaces from volumes and lines from surfaces.

**Stream Tracer** filter: Integrate streamlines in a vector field.

The purpose of **Lookmarks** is to save and restore particular views of one or more datasets.
3D-Application 1: Temperature plumes

1) Plane clipping (shown as “Surface“ = temperature data set)
2) Contour surface → smoothing → plane clipping & slicing
3) Box clipping (shown as “Outline“ = black boxes)
3D-Application 2: Stream lines

1) Box clipping (shown as “Surface“ = temperature data set)
2) Stream Tracer → plane clipping
3) Cone glyphs (colored for nodal velocities)

Adjust Camera:
Center of Rotation: 2000 / 500 / 700
Position: -1800 / 500 / 1400
Focal Point: 2400 / 500 / 1400
View Up: 0 / 1 / 0
View Angle: 30
Plotting data over a line / over time

Append Attributes filter: Copies geometry from first input. Puts all of the arrays into the output.

Plot Over Line filter: Sample data attributes at the points along a line. Probed lines will be displayed in a graph of the attributes.

Probe Location filter: Sample data attributes at the points in a point cloud.

Plot (Selection / Global Variables) Over Time filters: Extracts the selection / variables over time.
Exporting data to SigmaPlot

The **Spreadsheet view** displays the underlying data values in a dataset. From the Display tab for the dataset being shown, you can choose whether to display **Cell Data**, **Point Data**, or **Field Data**. The left-most column of numbers in the spreadsheet view lists the index for each entry in the spreadsheet (point ids for Point Data, cell ids for Cell Data), and the rest of the columns show the values at each index of the various arrays the dataset contains. Left-clicking on an entry in the spreadsheet view will select the corresponding point or cell in the dataset; if the dataset is also shown in a 3D view, the points or cells will be highlighted. Pressing the Shift key while clicking rows in the spreadsheet view allows you to select a range of rows; pressing the Ctrl key allows you to select several rows which may not be in sequence.
Need help!? 

- Help F1 – very basic!

  (2007: some filters out-of-date for ParaView 3.4)

- ParaView wiki: [http://www.paraview.org/Wiki/ParaView](http://www.paraview.org/Wiki/ParaView)

- Tutorial: [http://www.paraview.org/Wiki/The_ParaView_Tutorial](http://www.paraview.org/Wiki/The_ParaView_Tutorial)  
  (PDF download for ParaView 3.6)