Tumor Volume Measurement and Volume Measurement Comparison
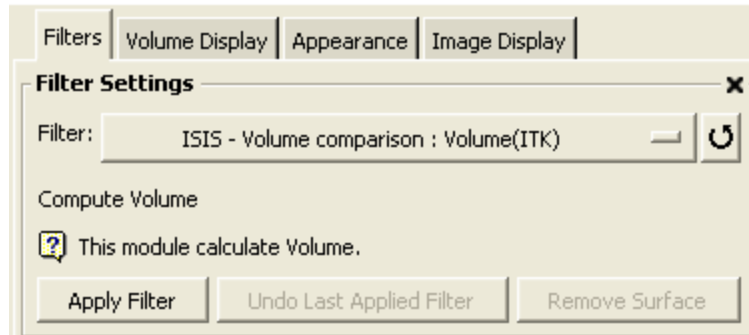**Plug-ins for ITK**

USER'S MANUAL
Rev.0.1

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1.Volview Filter User Interface

Every filter has a interface area.
The common elements to this interface area are the pulldown to specify the filter, the refresh button, and the brief description at the top of the area, and the long description, and three buttons at the bottom of this area. These are described below.

Filter: This pulldown can be used to select the filter. This is a cascading pulldown with seven categories. Selecting a filter from this list will change the appearance of the interface since each filter has its own set of configurable parameters.
Refresh: The refresh button is an icon in the shape of a circular arrow to the right of the Filter pulldown. If you install a new filter plugin during application run-time, you must press this button in order to update the Filter pulldown with the new filter. Please refer to the section on Extending Filters with Plugins for further information.
Brief Description: Below the Filter option menu will be a one line description of the selected filter.
Long Description: Just above the bottom three buttons will be a verbose description of the selected filter.
Apply Filter: This button will apply the selected filter to the currently loaded data. Once the filter has been applied, a timer label will be added above this button indicating how long the filter required to process the data. In addition, an information label may also be added providing information about the execution of the filter such as how many polygons are in the generated surface. If enough memory is available, the Undo Last Applied Filter button will be enabled, allowing you to undo this filter operation. If the data is large, this option will not be available and you will have to reload the data from disk in order to undo. If the filter generated a surface, then the Remove Surface button will be enabled, allowing you to remove the surface generated by the filter.
Undo Last Applied Filter: If there is enough memory, and the volume was modified by the last filter applied, this button will be enable. Pressing it will restore the volume to the state it was in before the filter was applied.

Remove Surface: If the previous filter generated geometric output, then this button will be enabled. You must remove the surface before you will be able to apply another filter.

2.Volume measurements Filters

The filters in this category are filters for volume mesurements tasks such as counting pixels. More detailed descriptions of each of the available filters in this category are provided below.

Voxel Count. It involves counting the number of voxels and then adjusting this number by the voxel volume. This method provides a coarse volume estimation.

Antialiased Voxel Count. Provides finer volume measurement by anti-aliasing the digital tumor volume.

3.Volume comparison Filters

MeanSurfaceDistance. This filter extracts the contour of the second volume and computes the average distance between the first tumor and this surface. The mean absolute surface distance is a metric used for computing the average distance between two volume data sets. There are cases where the Hausdorff distances for two volumes are approximately the same, but the average distances are very different. This measures the average distance between points on the surface of volumes.

Hausdorff-Chebyshev Metric Represent the maximum surface distance measure, which measures the largest difference between two tumor volumes.

The volumetric overlap metric. Compares sets of non-zero pixels from two binary image segmentations for relative overlap. This measure is derived from a reliability measure known as the kappa statistic Is sensitive to both differences in size and in location and has been described in the literature for comparing two segmentation masks. The measure gives a score of 1 for perfect agreement and 0 for complete disagreement. The overlap measure depends on the size and the shape complexity of the object.