

Segmentation, mesh generation and viewing functions

1. View images

- 1.1. When users select a metainage file of image.mhd in Image viewer, "Dimension", "Spacing" and "Origin" are automatically set on GUI.
- 1.2. When users read only a rawimage file of image.raw, users should input "Dimension", "Spacing" and "Origin" and from such information, header file of image.mhd is generated automatically.
- 1.3. Then, each X, Y and Z axis cross section image are displayed on one of four divided windows (Fig.1.1).

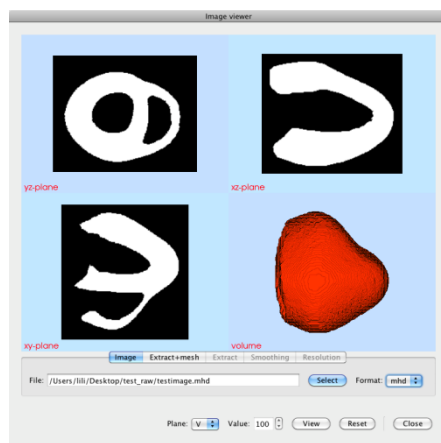


Fig.1.1 Images

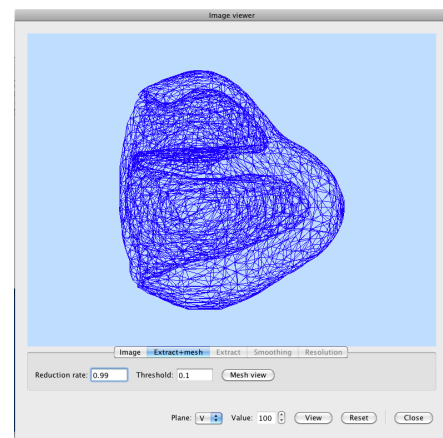


Fig.1.2 Surface model

2. Extract+mesh

- 2.1. Switching to "Extract+mesh" tab, users set "Reduction rate" and "Threshold" values. Clicking "Mesh view" tab, surface topology is extracted from image and surface mesh is generated and it is displayed on one of small windows (Fig.1.2).
- 2.2. Surface unstructured grid file of image.vtk is generated in the same directory.
- 2.3. Adjusting "Reduction rate" and "Threshold" values and viewing it, the surface mesh should be optimized and users can obtain the surface mesh to need.

3. Volume mesh generation

- 3.1. Assigning image.vtk file made in section of 2.3 as an external file of geometry definition of Morphology dialog, it is displayed by Geometry viewer (Fig.2.1).
- 3.2. Specifying "3D" and "Option" parameters of "Mesh" groupbox, then push "Save" button. Providing save file name and path, volume mesh file is generated from surface mesh file.

- 3.3. When "Save" button is pushed, image.geo file for gmsh mesh generator is generated. Using gmsh, volume mesh is generated and saved at the users' specified place.
- 3.4. Pushing "view" button of "Mesh" groupbox, volume mesh file generated in section 3.3 is displayed (Fig. 2.2).
- 3.5. Put a check to "Clip" check box in Clipping group, volume mesh can be checked (Fig. 2.3).

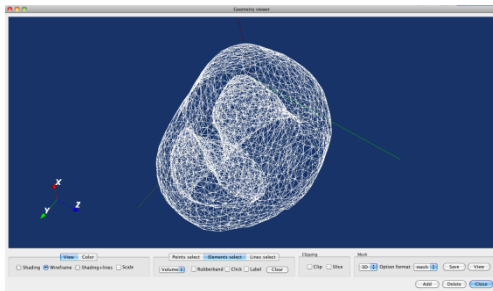


Fig.2.1 Surface model

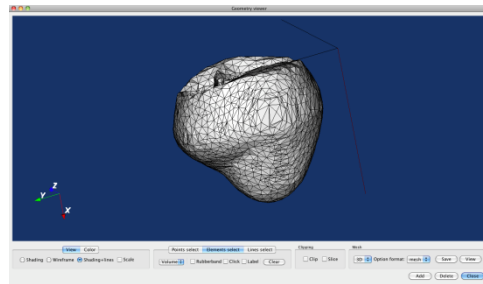


Fig.2.2 Solid model

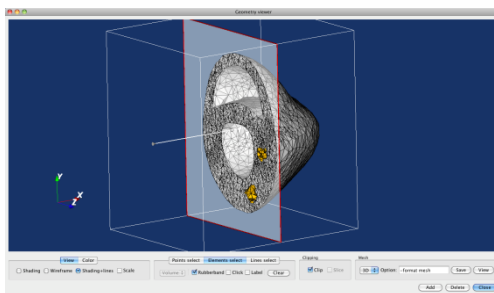


Fig.2.3 Clipping

About gmsh

Mesh generator gmsh is used for volume mesh generation.
<http://geuz.org/gmsh/>

Users should download gmsh as follows.

From above home page of gmsh, necessary files can be downloaded from "Download" section.

gmsh-2.5.0-Windows.zip for Windows

gmsh-2.5.0-MacOSX.dmg for MacOS

Placing it into your preferred directory and extracting it, get executables gmsh.exe (Windows) or gmsh (Mac).

Currently support version of gmsh is "2.5.0"

Recommended install directory:

On Windows: C: (instantly access C:\gmsh-2.5.0-Windows\gmsh.exe)

On Mac: /Applications (instantly access /Applications/Gmsh.app/Contents/MacOS/gmsh)

If gmsh executable is not here, ISIDE/PD will ask users install directory.