## How to use labeled (indexed) volumes?

How to use labeled volumes available at 3dBAR on-line service website?

You can download two types of volumetric datasets from 3dBAR online. One of them is labeled volume containing all structures from given atlas. If such a volume is available for a chosen atlas, you can download it either from **Live Preview** or **Atlas Details** tab.

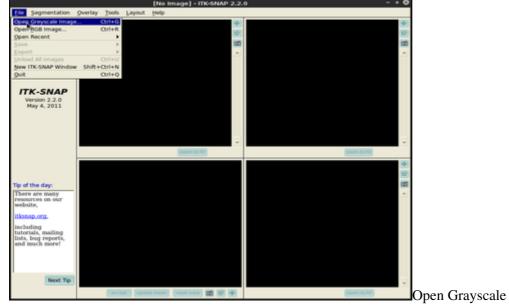
The tutorial below demonstrates how to load the labeled volumes along with the appropriate lookup table into <u>ITK-Snap</u> and how to generate polygonal meshes of selected structures. Similar tasks may be performed using other software (e.g. <u>Paraview</u> or <u>3D Slicer</u>), we have choosen ITK-Snap as we find it lightweight and convenient to use. As an example, we will use the indexed volume of <u>NeuroMaps</u> Macaque monkey brain atlas available from <u>Scalable Brain Atlas</u>.

Steps to follow:

- 1. Download a zip file with the labeled volume from 3dBAR website and extract its contents. The zipfile contains three files:
  - The indexed volume itself (.nii.gz),
  - A lookup table providing names of structures along with a color map,
  - ♦ A short advertisement of off-line 3dBAR tool

[screenshot with live preview] [screenshot with atlas details]

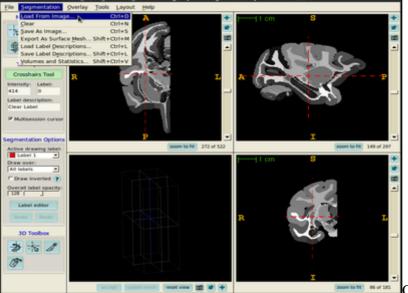
2. Open ITK-Snap and select **Open Grayscale Image...** from the **File** menu. Then, select the NIfTI volume <u>vou extracted</u>. The volume will be loaded as a grayscale image.



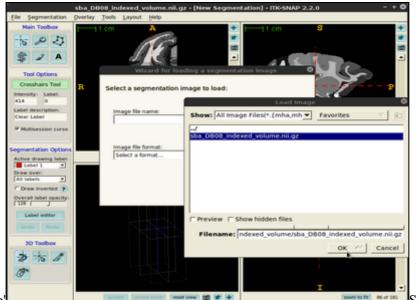
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Image?

3. Then, choose **Segmentation**, **Load from image** menu and select the same volume file as in the previous point. This time the volume will be loaded as *Segmentation* denoting consecutive structures.



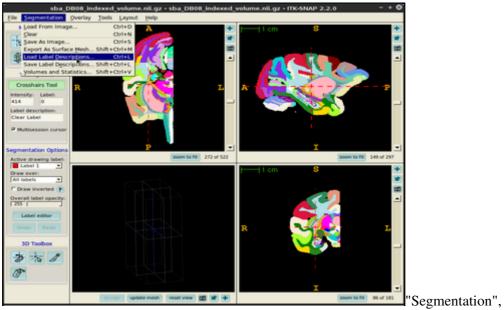
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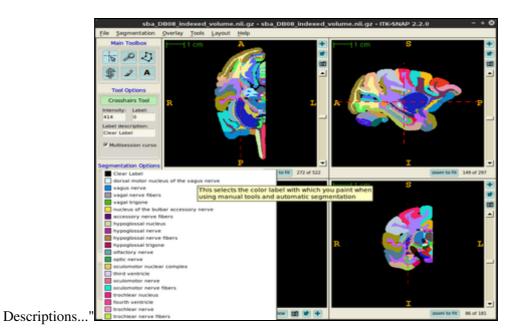
from image'

Select the same NIfTI file

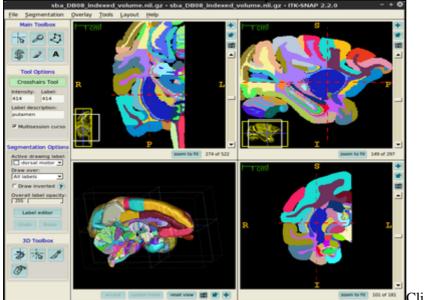
4. The next task is to load the lookup table. From the **Segmentation** menu select **Load Label Descriptions...** and select the text file with the lookup table. Now all indexed structures from the *Segmentation* image are linked with appropriate names and segmentation colors.



"Load Label

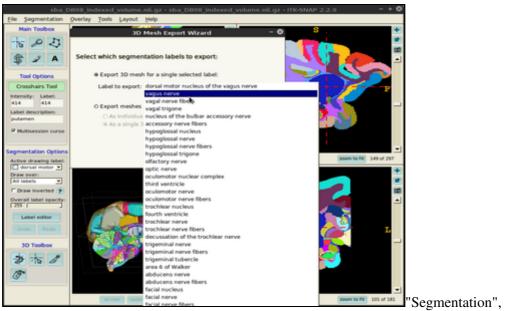


5. In order to generate a surface mesh click **Update mesh** button located at the bottom of the ITK-Snap window. After a while the mesh will be ready.



Click 'update mesh' button

6. You can also export the surface meshes for selected structures (single structure as well as multiple structures in a single file). In order to do this, choose **Segmentation**, **Export As Surface Mesh** and follow the on-screen instructions provided by the **3D Mesh Export Wizard**.



"Export As Surface Mesh"

7. You can always customize surface mesh generation settings using Tools -> Display Options -> 3D Rendering dialogue.

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