Oblique Sections: Oblique Resizing of Volumes

Sometimes a particular structure of interest within a data set is not aligned with the orthogonal axes of the 3-D volume. The Oblique Sections module interactively generates any arbitrary plane through a data set and allows reformatting of a series or the entire data set. This exercise will demonstrate how to create an obliquely resampled data set for further analysis with Analyze.

1. Load the **Canine_Chest_CT.avw** data set from the **$:\BIR\images\ TutorialData** directory.

2. Open the **Oblique Sections** module (**Display > Oblique Sections**).

3. Open the **Fly** tool (**Generate > Fly**).

4. Use the Fly tool (figure 1) to rotate the current oblique plane from the transverse orientation to the sagittal orientation:

   v. Click the **Roll Right** button nine times to rotate the oblique plane into the sagittal orientation. The **Fly Value** defaults to **10**, so for each selection of 'Roll Right', the plane is rotated by 10 degrees (90 total).

   vi. Given that the view of this sagittal orientation is as if the body was in a prone position, click the **Yaw Counter Clockwise** button nine times to rotate the body upright. This is a right lateral view of the chest.

   vii. If a left lateral view is desired, click the **Roll Left** button to complete a roll of the oblique plane by 180 degrees (select the button 18 times). Note that the plane appears to rotate through the data set, passing from a right lateral view to a left lateral view.

8. Reset the oblique plane to the central transverse slice by selecting the '**T**' Cube at the bottom of the Fly tool.

tip   The 'Fly Value' [B] can be changed to make incrementally larger or smaller changes when performing manipulations (e.g. set the 'Fly Value' to 180 and press 'Roll Left' once to rotate 180 degrees).
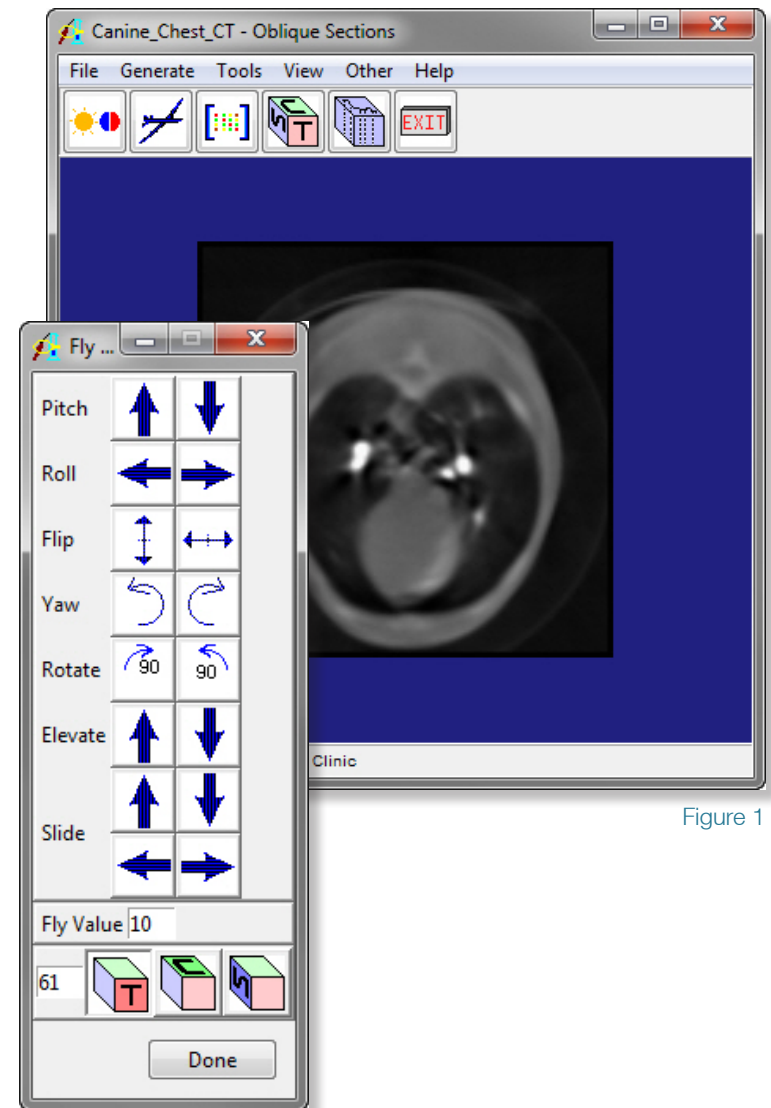

Figure 1

AnalyzeDirect

9. Open the **Matrix Tool** (**Tools > Matrix**) to display the current transformation matrix that reflects this 3-D orientation (figure 2).

10. Now, complete the "fly" maneuvers as given above to rotate from the transverse orientation to the sagittal orientation again. Note the changes in the transformation matrix in the Matrix tool as these maneuvers are carried out. This demonstrates that the oblique plane manipulation is represented as a full 3-D transformation, with resampling of the data occurring based on the respective 3-D transformation as given in the matrix.

11. Use the **Fly** tool to select an arbitrary oblique orientation of your choice. For example, click the Roll Right button three times, then the **Yaw Clockwise** button four times.

12. To save the data set in this oblique orientation, choose **File > Output**.

13. In the **Output** window, set **Destination** to **Workspace** and change **Name** to **xxx_myoblique** (where 'xxx' are your initials) (figure 3).

14. To resample the entire data set, set Method to **Reformat Entire Volume**. Since this is an oblique orientation, the resampling space for the new data set may need to be larger than the original, so by default the **Change to best fit data** option is selected to output a large enough data set to capture all transformed voxels.

15. Click **Generate Slices**. The resampled data set is now saved to the Analyze workspace.

16. Close the Oblique Sections module before proceeding to the Additional Task.

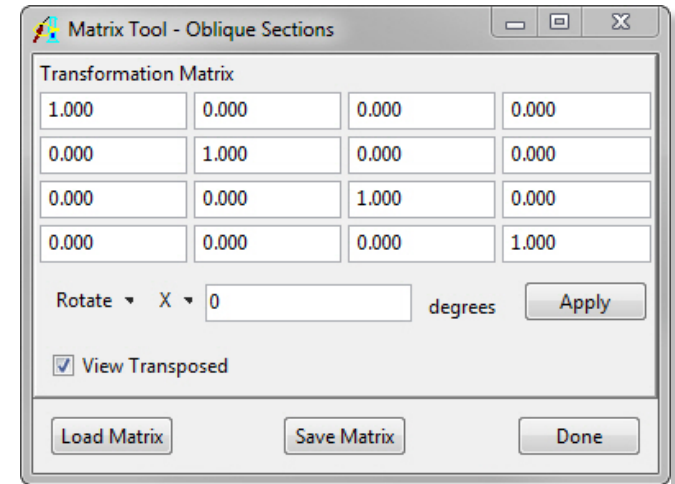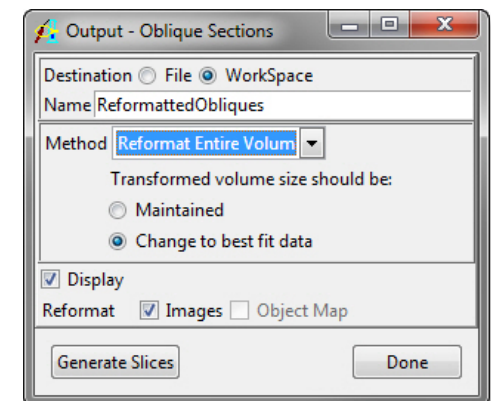17. To view your new reformatted data set, open it with the Multiplanar Sections module.

Figure 2

Figure 3

Oblique Sections: *Grid Align*

The Grid Align tools provide users with the ability to interactively reorientate image data using a grid overlay on the current oblique **slice, this** allows for easy reorientation with reference to structures in the slice. The grid allows for reorientation via translation and yaw of the oblique slice. This task will demonstrate how to reorientate data using the tool.

1. Load the **MRI_3D_Head.avw** data set from the **$:\BIR\images\TutorialData** directory.

2. Open the **Oblique Sections** module (**Display > Oblique Sections**).

3. Open the **Fly** tool (**Generate > Fly**). Use the Fly tool to set the display orientation to Sagittal by clicking on the S-cube.

4. Next select **Generate > Grid Align** to apply the grid overlay to the current slice.

Translation:

- Click to select a point near the center of the grid axis (anywhere within the 36 center boxes).

- While holding the mouse button down, move your cursor so that the center intersection of the grid is moved to the new desired location, in this example the middle of the cerebellum.

- Release the mouse button. The image will be translated with the selected region as the new center point.

AnalyzeDirect
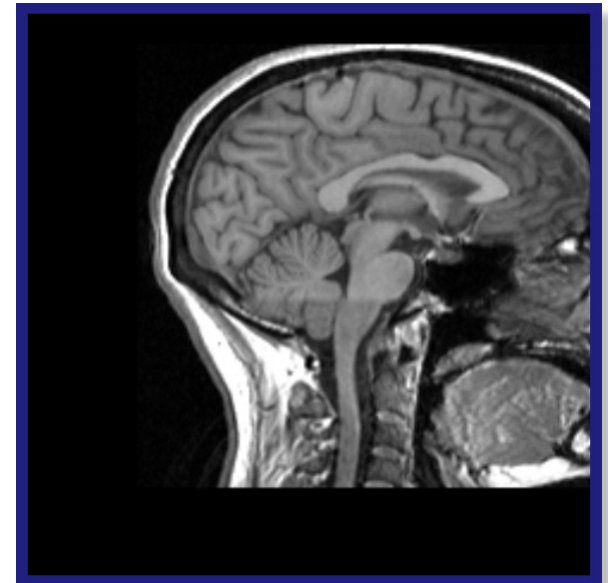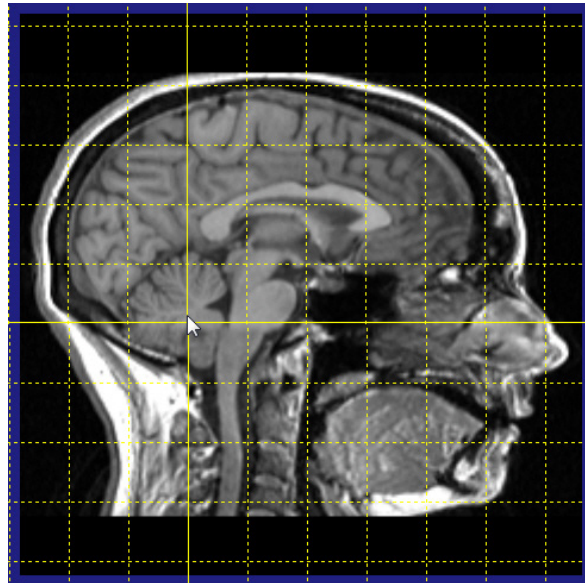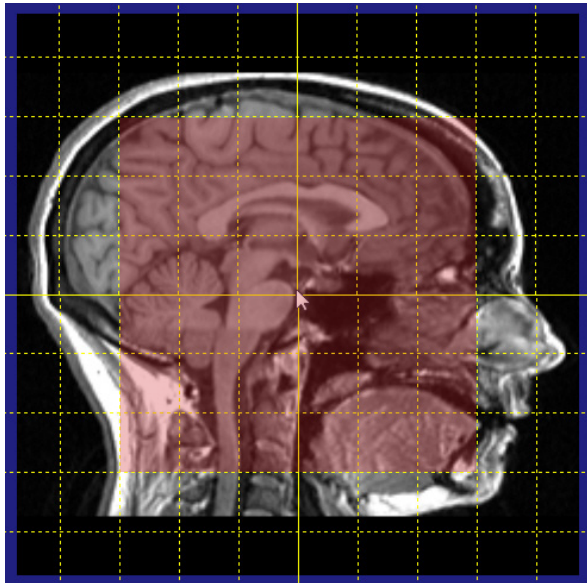
Oblique Sections: *Grid Align*

5. Click on the **S-Cube** in the Fly tool to reset the image display.

Yaw

6. Click to select anywhere towards the outside of the grid (anywhere not within the 36 center boxes).

7. While holding the mouse button down, move your cursor to rotate the grid about the center axis, in this example, aligning a grid line along the brain stem.

8. Release the mouse button to apply the **Yaw** reorientation to the image.

9. Close all Oblique Sections windows before proceeding to the next exercise.

AnalyzeDirect