2D Registration

The 2D Registration module determines geometric transformation parameters which can be used to align 2D images, section to section by matching common contours or by matching sections to a single base slice. This exercise will demonstrate how to do this using the 2D Registration module to align a series of misaligned 2D slices.

1. Load the **Spinal_Cord** data set from the **$:/BIR/images/TutorialData** folder.

2. Open the **2D Registration** module (**Register > 2D Registration**).

3. Open the **Cursor Link** Tool (**Tools > Cursor Link**).

4. Choose a **Blend** from the right-click menu in the upper right pane.

5. To review the data slice by slice, use the **Match Section** slider bar.

6. If required, slice data can be manually adjusted using the manual adjust control operations.

7. The **% Base Image** allows the combined image display (upper right pane) to fade between the base and match image.

8. Open the **Control** window (**Generate > Control**).

9. Choose between a **Sequential** or **Single** reference registration mode (figure 2):

    Sequential: each slice will register sequentially to its neighbor (ie slice 2 to slice 1, slice 3 to slice 2, etc.)

    Single Reference: will register each slice to a single base slice (defined with the To Section slider).

10. The **Register Section** and **Thru** slider bars allow users to determine a range of slices to be registered (ie slices 10-20 only).

11. Set the registration mode to **Sequential**, then click **Done**.
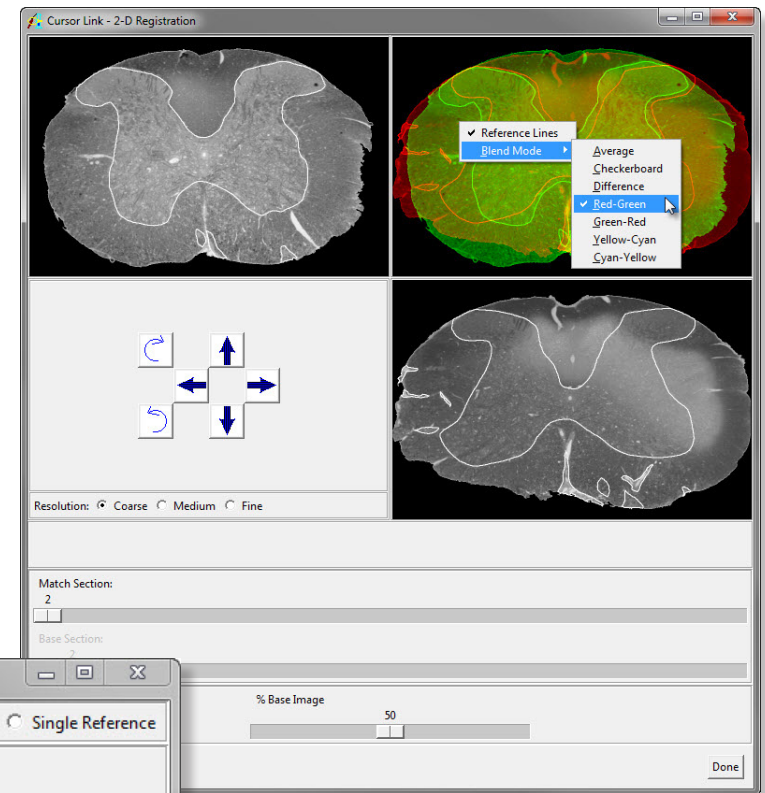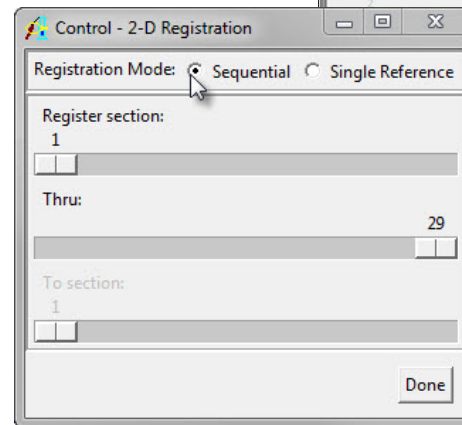

Figure 1

Figure 2

2D Registration

12. Open the **Voxel Match** window (**Generate > Voxel Match**), expand the **Threshold**, **Sample Region** and **Search Parameters** options (figure 3).

13. Check the **Show Thresholding** option the image, the cursor link tool will update converting the images to binary representations. Only voxels displayed as white will be considered for the registration.

14. Set the **Minimum threshold** value to **5** to eliminate background noise. Then uncheck the Show Thresholding option.

15. The Sample Region option will allow for defining a region to consider for registration. See the **X Minimum** to **69** and the **X Maximum** to **333**. Then set the **Y Minimum** to **33** and the **Y Maximum** to **237**. Reset the Min/Max X and Y values before proceeding. Note the region is defined on the blended and match image (figure 4).

16. The Search Parameters option allows users to adjust the X and Y Translation range, the Z Relation range and the X and Y Scaling range.

17. Click **Register**. Select **Generate > Transform Slices**, set the **Destination** to **Analyze Workspace**, then click **Go**. The data will be transformed and saved to the Analyze workspace.

18. Compare the input and output data sets to see the effect of the registration on the data.
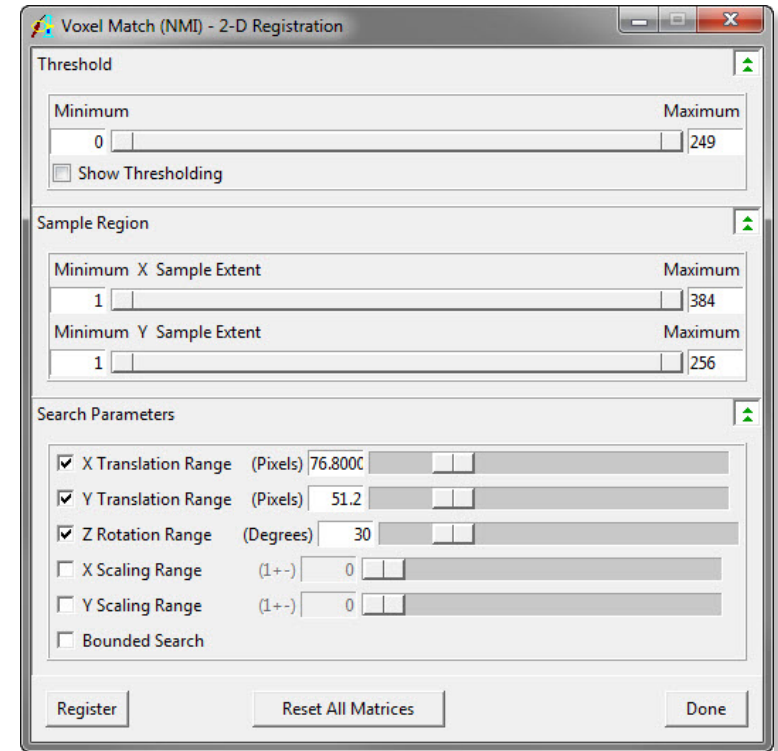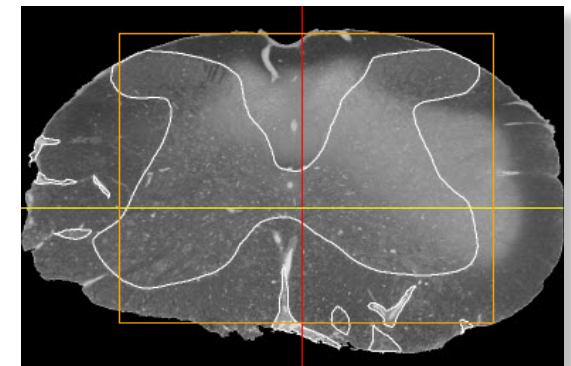
Figure 3

Figure 4

AnalyzeDirect