

# 3D Voxel Registration: Mutual Information

This exercise will demonstrate how to adjust a 3-D registration starting position to achieve an optimal registration of two 3-D volume images.

1. Load both the **Register\_MRI\_Base.avw** and **Register\_MRI\_Match.avw** data sets from the **C:\BIR\images\TutorialData** directory.
2. In the Analyze workspace, first select the **Register\_MRI\_Base** data set. Then, while holding down **<Ctrl>** select the **Register\_MRI\_Match** data set (resulting in both being selected).
3. Open the **3-D Voxel Registration** module (**Register > 3-D Voxel**).
4. Choose **File > Input/Output Ports** to ensure that **Register\_MRI\_Base** is assigned as the 'Base Volume' and **Register\_MRI\_Match** is assigned as the 'Match Volume'.
5. Open the **Blend** window (**Generate > Blend**). Select the **Red-Green** blend and then click **Done**. The 'Red-Green' blend option will help evaluate the registration (figure 1).
6. Press the **Register** PowerBar button or choose **Generate > Register**.
7. Examine the center 'Fused' column of the main module window (figure 1). As you can see, the registration is not acceptable.

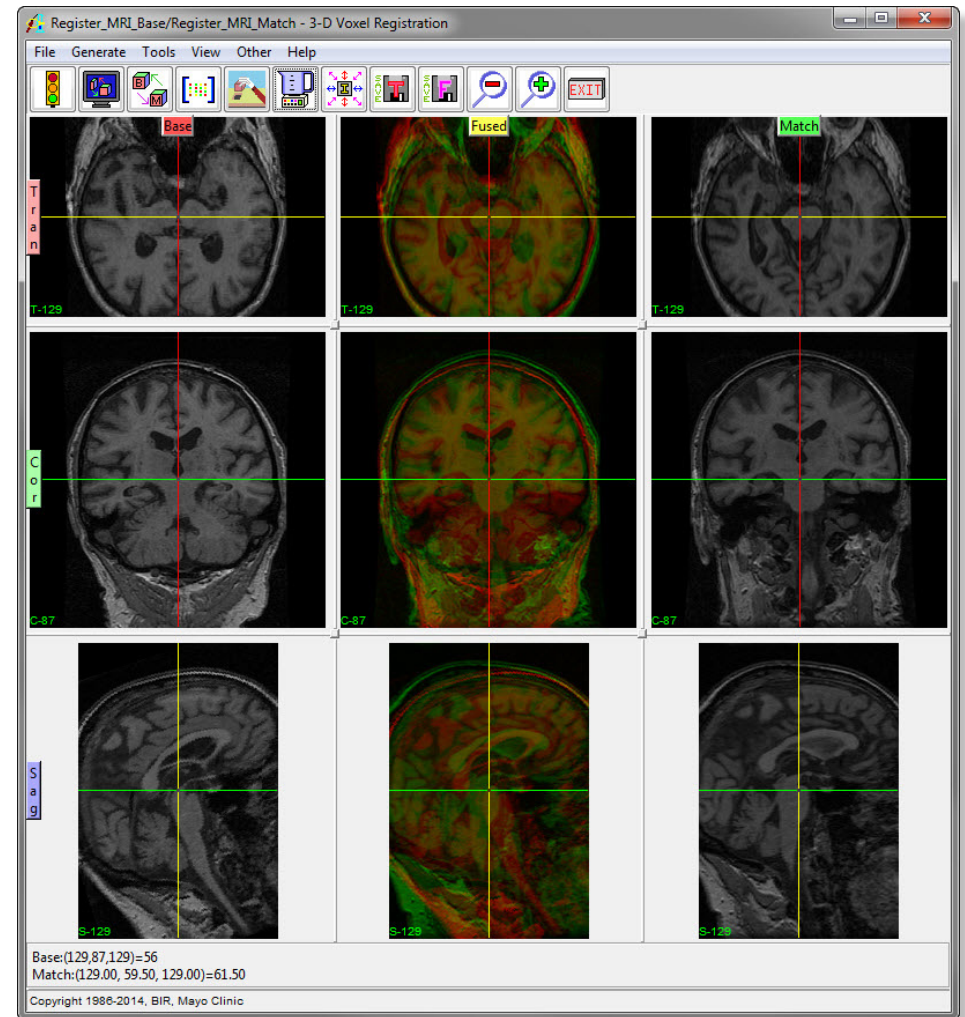


Figure 1

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## Manual Adjustment

8. Since the registration is not acceptable, manually adjust the starting point of the registration. Open the **Manual** tool (**Tools > Manual**).
9. Click **Reset Matrix** in the Manual tool (figure 2), this will reset the match volume to the original starting position.
10. Now, using the Manual tool options, move the match volume to a better starting position and press **Register**.
11. If the registration is still not acceptable, return to the Manual tool and click **Reset Matrix** again.
12. Now, select the **Coarse** adjustment option and press the **down** arrow button once.
13. Change the orientation from coronal to sagittal by selecting the **S-cube** and then press the right arrow button once.
14. Press **Register**. The volumes should now register correctly.

## Saving

15. To save the transformed match volume (Register\_MRI\_Match), choose **File > Save Transformed**; the transformed volume can be saved to disk or to the Analyze workspace.
16. To save the fused volume, choose **File > Save Fused**; the fused volume can be saved to disk or to the Analyze workspace (figure 3).
17. Close the 3-D Voxel Registration module before proceeding to the next exercise.

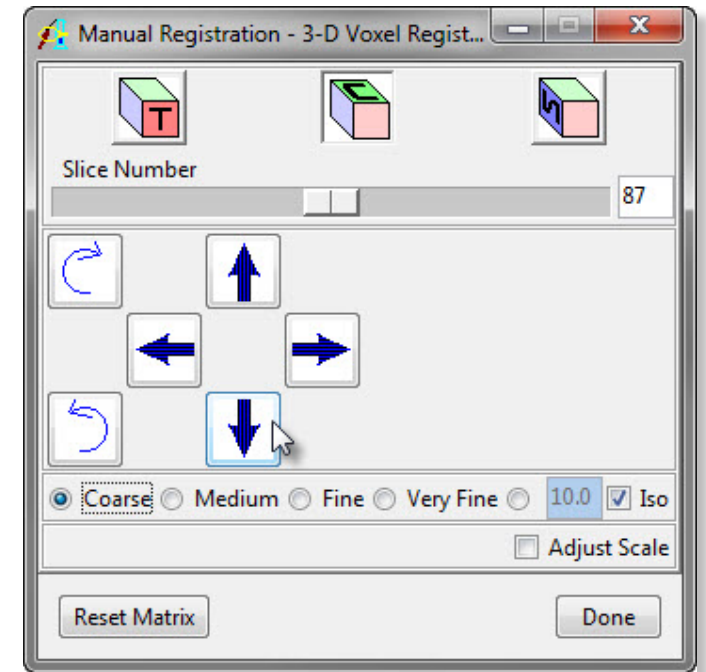


Figure 2

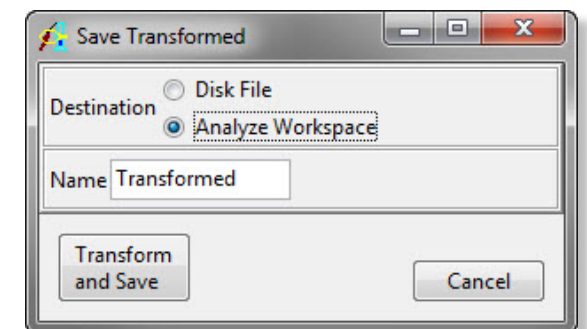


Figure 3