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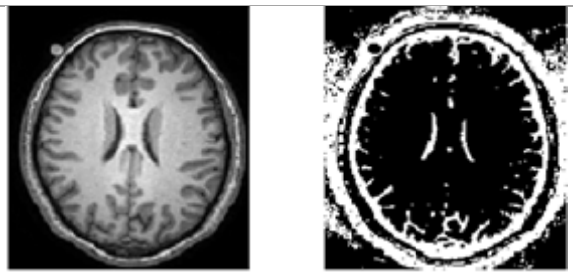
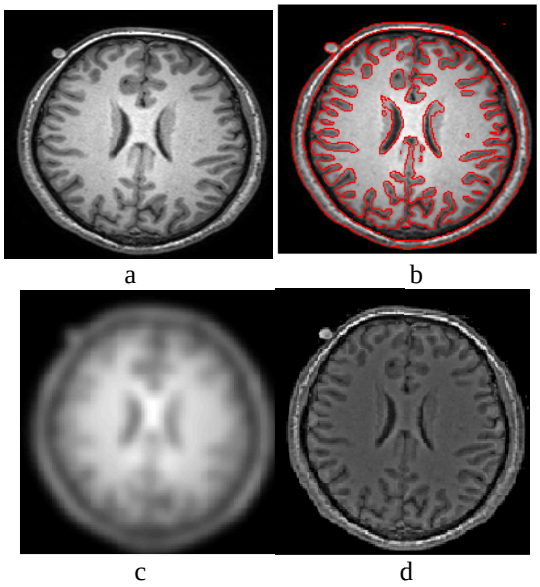


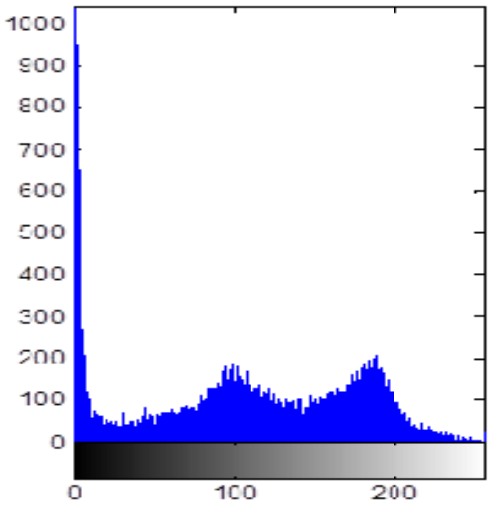
Figure 3
a) Input image, b) Initial feature segmented image



a b c d

Figure 4
a) Original image b) Segmented Image
c) Blurred image (Estimated Bias field), d) Bias corrected image

It can be seen that the intensities within each tissue become quite homogeneous in the bias corrected images. The improvement of the image quality in terms of intensity homogeneity can be also demonstrated by comparing the histograms of the original images and the bias corrected images.



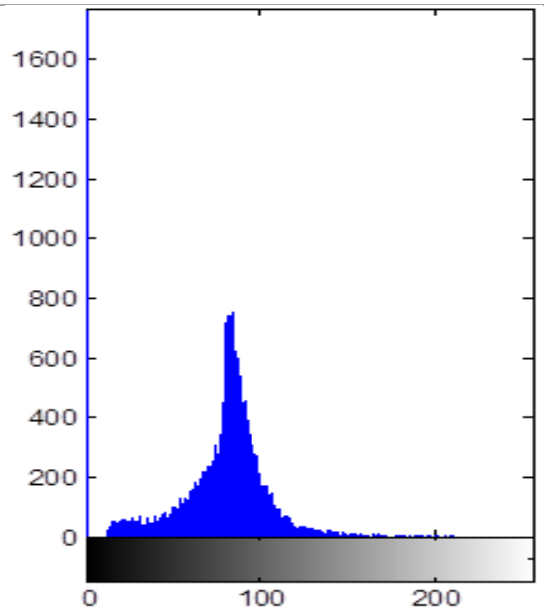
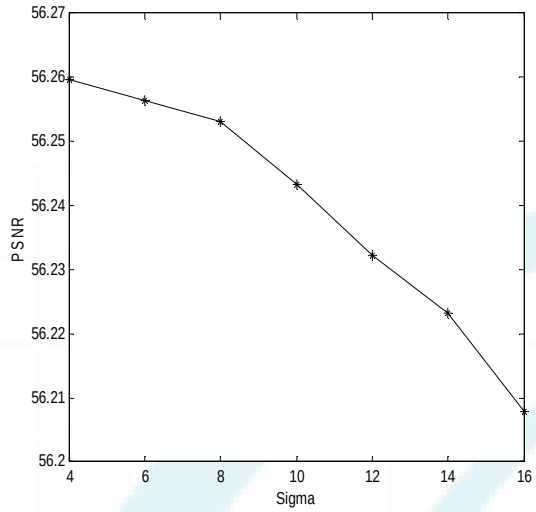


Figure 5: Histograms of Original image (Top), Bias corrected image (below)

The histograms of the original images (left) and the bias corrected images (right) are plotted in the fifth column. There are three well-defined and well-separated peaks in the histograms of the bias corrected image, each corresponding to a tissue or the background in the image. In contrast, the histograms of the original images do not have such well-separated peaks due to the mixture of the intensity distribution caused by the bias.

6. Performance Evaluation

As a level set method, our method provides a contour as the segmentation result. We use the MSE (Mean Square Error), and SNR (Signal to Noise Ratio) plots as the performance Measure and the Graphs are shown below explaining the Variation of MSE and SNR with 7 Values of Sigma and at 7 different initializations.



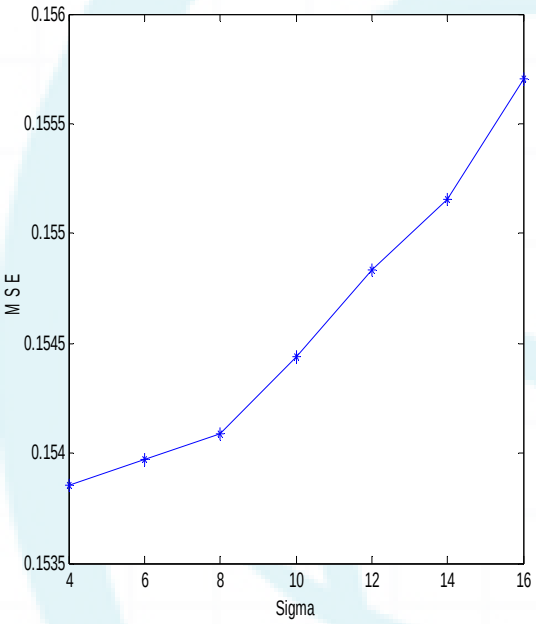
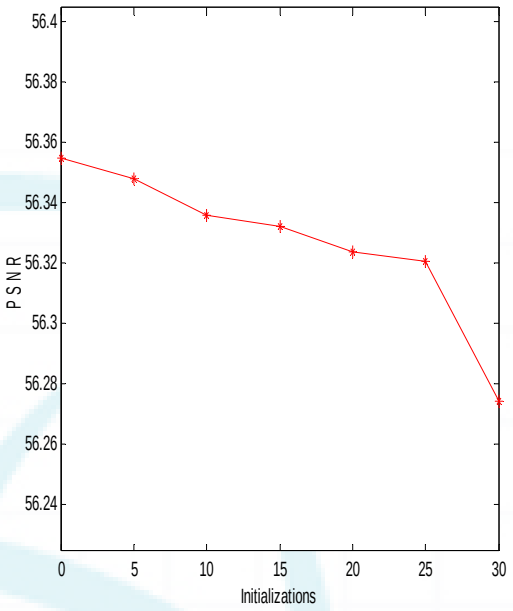


Figure 6: Plots for MSE, PSNR with different sigma values



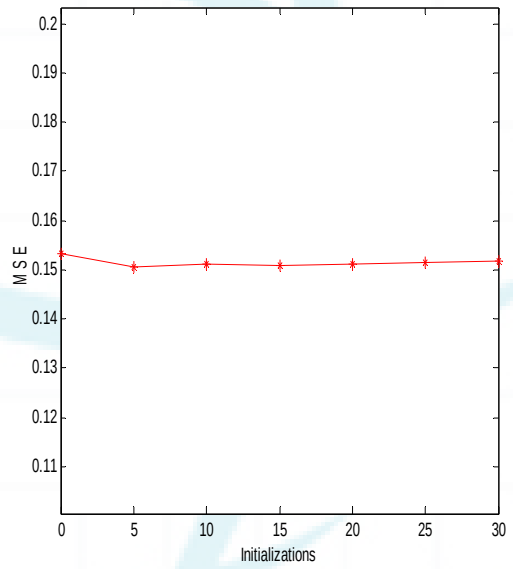


Figure 6: Plots for MSE, PSNR with different initializations

7. Conclusion

A Level Set based segmentation and bias correction of images is implemented in this paper. For the given MRI image with intensity inhomogeneities and a derived local intensity clustering property, we define energy of the level set functions that represent a partition of the image domain and a bias field that accounts for the intensity inhomogeneity. Segmentation and bias field estimation are therefore jointly performed by minimizing the proposed energy functional. This method is evaluated by using MSE and SNR plots and contrast and Brightness are improved.

8. Future Scope

In this paper we implemented the segmentation by considering the intensity inhomogenity of MRI image. There are also articrafts in MRI image which corrupt the

details of the image such as partial volume effects, for which different tissue types contribute to the intensity of one voxel, RF noise etc., Further this segmentation can be extended to the MRI images with the articrafts mentioned above.

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