ISSN XXXX XXXX © 2017 IJESC

Research Article Volume 7 Issue No.6

Image EDGE Enhancement using Image Fusion Technique

Devishree Devang[1], AnushriDambaye[2], Asif Khan[3], Dr.Deepali Sale[4]
Student[1, 2, 3], Assistant Professor[4]
Department of Electronics and Telecommunications Engineering[1, 2, 3], Department of Computer Engineering[4]
D. Y. Patil Institute of Technology, Pimpri, Savitribai Phule University, Pune, India

Abstract:
This paper presents a curvelet based approach for the fusion of magnetic resonance (MR) and computed tomography (CT) images. The objective of the fusion of an MR image and a CT image of the same organ is to obtain a single image containing as much information as possible about that organ for diagnosis. Some attempts have been proposed for the fusion of MR and CT images using the wavelet transform. Since medical images have several objects and curved shapes, it is expected that the curvelet transform would be better in their fusion. The simulation results show the superiority of the curvelet transform to the wavelet transform in the fusion of MR and CT images from both the visual quality and the peak signal to noise ratio (PSNR) points of view. Edge parameter QABF is calculated to find the percentage of information from each image in the fused image.

I.INTRODUCTION

In computer vision, Multisensor Image fusion is the process of combining relevant information from two or more images into a single image.[1] The resulting image will be more informative than any of the input images.[2] The term fusion means in general an approach to extraction of information acquired in several domains. The goal of image fusion(IF) is to integrate complementary multisensor, multitemporal and/or multi view in forma- tion into one new image containing information the quality of which cannot be achieved otherwise. The term quality, its meaning and measurement depend on the particular application. Image fusion has been used in many application areas. In remote sensing and in astronomy, multisensory fusion is used to achieve high spatial and spectral resolutions by combining images from two sensors, one of which has high spatial resolution and the other one high spectral resolution.

II.RELATEDWORK

Numerous fusion applications have appeared in medical imaging like simultaneous evaluation of CT, MRI, and/or PET images. Plenty of applications which use multisensor fusion of visible and infrared images have appeared in military, security, and surveillance areas. In the case of multi view fusion, a set of images of the same scene taken by the same sensor but from different viewpoints is fused to obtain an image with high In computer vision, Multisensor Image fusion is the process of combining relevant information from two or more images into a single image.[1] The resulting image will be more informative than any of the input images.[2] The term fusion means in general an approach to extraction of information acquired in several domains. The goal of image fusion(IF) is to integrate complementary multisensor, multitemporal and/or multiview information into one new image containing information the quality of which cannot be achieved otherwise. The term quality, its meaning and measurement depend on the particular application. Image fusion has been used in many application areas. In remote sensing and in astronomy, multisensor fusion is used to achieve high spatial and spectral resolutions by combining images from two sensors, one of which has high spatial resolution and the other one high spectral resolution. her resolution than the sensor normally provides or to recover the 3D representation of the scene. The multitemporal approach recognizes two different aims. Images of the same scene are acquired at different times either to find and evaluate changes in the scene or to obtain a less degraded image of the scene. The former aim is common in medical imaging, especially in change detection of organs and tumors, and in remote sensing for monitoring land or forest exploitation. The acquisition period is usually months or years. The latter aim requires the different measurements to be much closer to each other, typically in the scale of seconds, and possibly under different conditions. The list of applications mentioned above illustrates the diversity of problems we face when fusing images. It is impossible to design a universal method applicable to all image fusion tasks. Every method should take into account not only the fusion purpose and the characteristics of individual sensors, but also particular imaging conditions, imaging geometry, noise corruption, required accuracy and application-dependent data properties. Image fusion has become a common term used within medical diagnostics and treatment.[3] The term is used when multiple images of a patient are registered and overlaid or merged to provide additional information. Fused images may be created from multiple images from the same imaging modality,[4] or by combining information from multiple modalities,[5] such as magnetic resonance image (MRI), computed tomography (CT), positron emission tomography (PET), and single photon emission computed tomography (SPECT). In radiology and radiation oncology, these images serve different purposes. For example, CT images are used more often to ascertain differences in tissue density while MRI images are typically used to diagnose brain tumors. For accurate diagnoses, radiologists must integrate information from multiple image formats. Fused, anatomically consistent images are especially beneficial in diagnosing and treating cancer. With the advent of these new technologies, radiation oncologists can take full advantage of intensity modulated radiation therapy (IMRT). Being able to overlay diagnostic images into radiation planning images results in more accurate IMRT target tumor volumes.

III.METHODOLOGY

1. Algorithm

A curvelet based algorithm is introduced for this purpose. This algorithm is summarized as follows:

(1) The MR and the CT images are registered.

(2) The curvelet transform steps are performed on both images

(3) The maximum frequency fusion rule is used for the fusion of the

ridgelet transforms of the subbands Δ1 and Δ2 of both images.

(4) An inverse curvelet transform step is performed on P3 of the MR image and the fused subbands Δ1 and Δ2.

2.Dataimages

Data images are CT scan and MRI images of the same person. These two images are fused with the help of curvelet fusion technique and an improved quality of image with curved edges are obtained.

Figure.1.CT SCAN

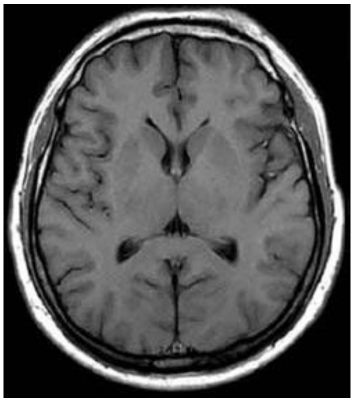


Figure.2. MRI IMAGE

3.CODE

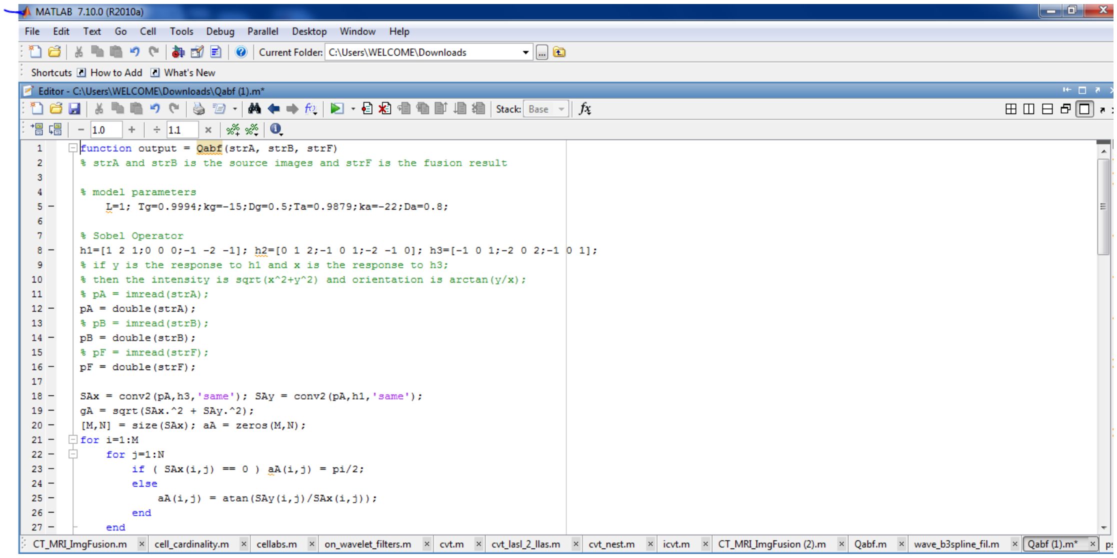


Figure.1. Snapshot 1

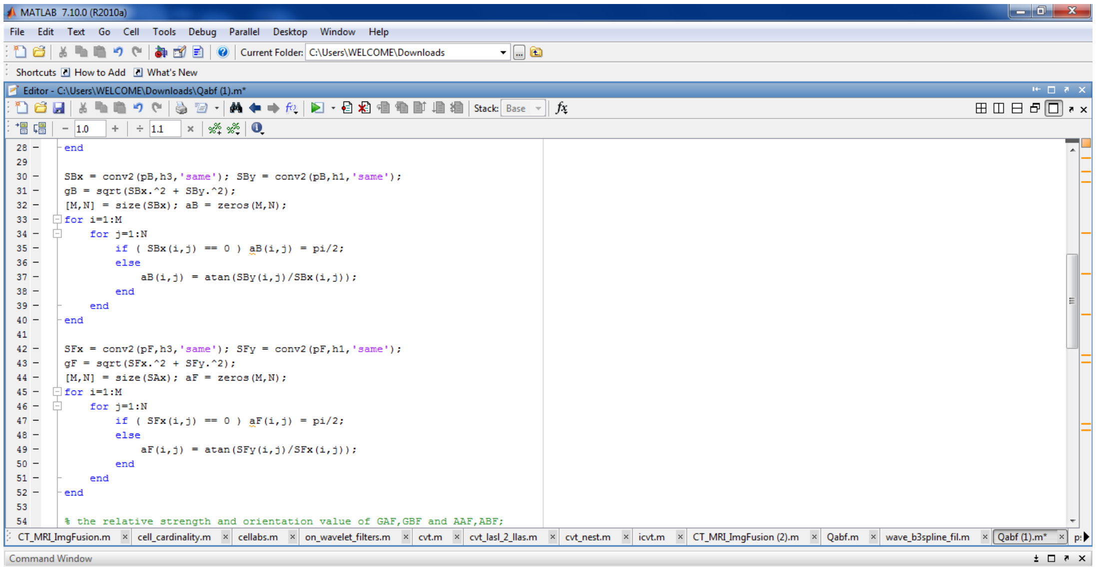


Figure.2.Snapshot 2:

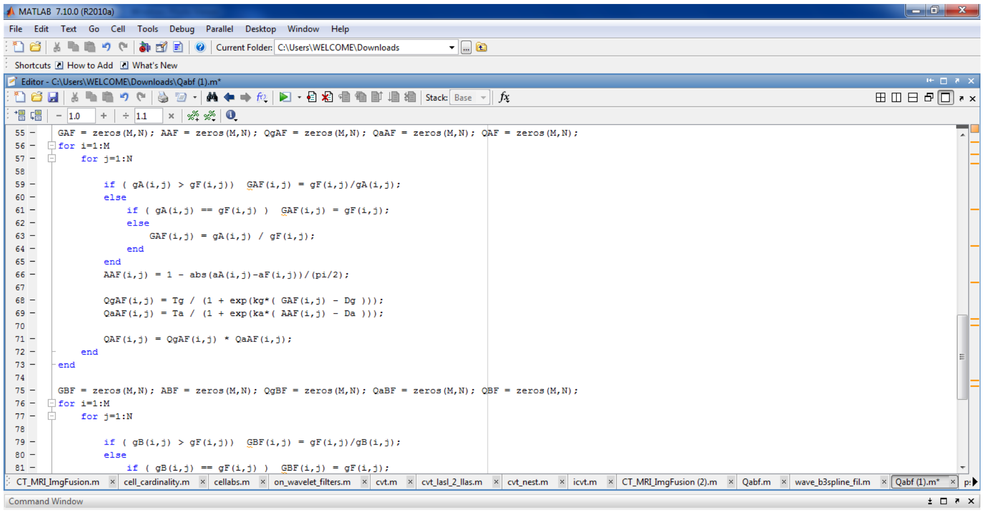


Figure.3. Snapshot 3:

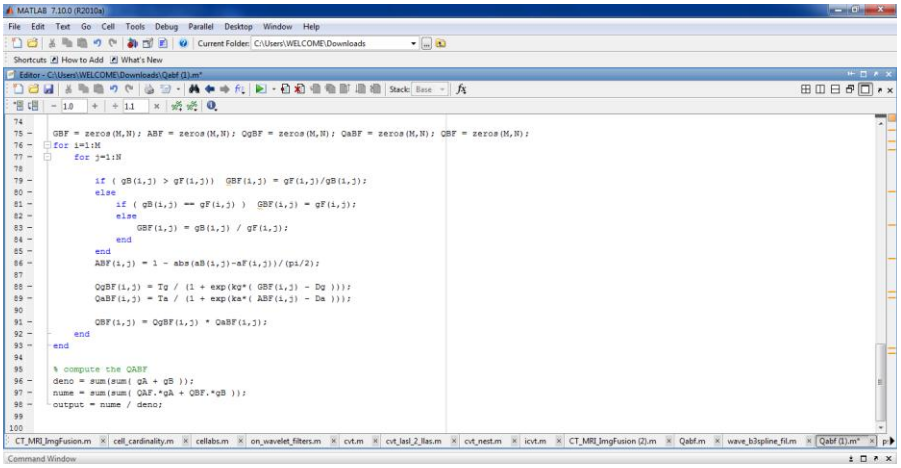
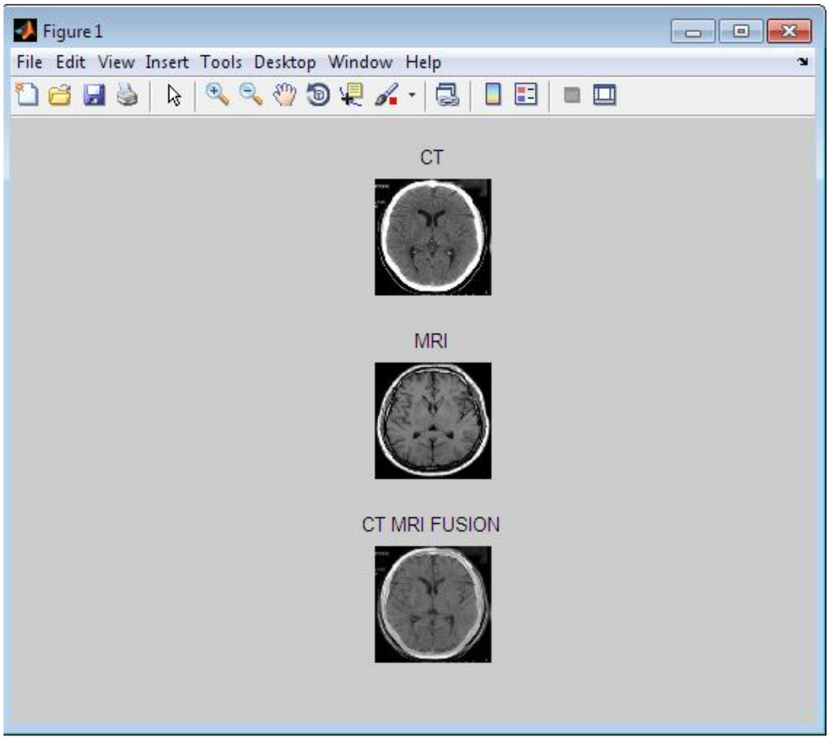


Figure.4. Snapshot 4

IV. RESULT



V.CONCLUSION

In this paper we fused two medical images by curvelet fusion technique and we tried enhancing the curved egdes of the images by curvelet fusion technique. And we calculated two edge based parameters QABF and UIQI.

VI. REFERENCES

[1]. ManinderKaur ,Pooja,"Wavelet and Curvelet Transformation based Image Fusion with ANFIS and VM", International Journal of Computer Applications (0975 – 8887) Volume 121 – No.14, July 2015

[2]. H. Hariharan, A. Koschan and M. Abidi,"The Direct Use Of Curvelets in Multifocus Fusion", 978-1-4244-5654-3/09/$26.00 ©2009 IEEE.

[3]. Xuelong HU1, Huimin LU1, 2, "A New Type of Multi-focus Image Fusion Method Based on Curvelet Transforms", 978-0-7695-4031-3/10 $26.00 © 2010 IEEE.

[4]. Sweta K. Shah1, Prof. D.U. Shah, "Comparative Study of Image Fusion Techniques based on Spatial and Transform Domain", International Journal of Innovative Research in Science, Engineering and Technology (An ISO 3297: 2007 Certified Organization)Vol. 3, Issue 3, March 2014

[5]. Neelesh Gupta &Meha Shrivastava, "A New Image Fusion Method based on Integration of Wavelet and Fast Discrete Curvelet Transform", International Journal of Computer Applications (0975 – 8887) Volume 69– No.18, May 2013

[6].Vishal P.Tank, Divyang D. Shah "Image Fusion Based On Wavelet And Curvelet Transform", IOSR Journal of VLSI and Signal Processing (IOSR-JVSP) Volume 1, Issue 5 (Jan. - Feb 2013)