Image EDGE Enhancement using Image Fusion Technique
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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. The resulting image will be more informative than any of the input images. 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 formation 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. RELATED WORK
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 spatial and spectral resolutions. Multisensor Image fusion is the process of combining relevant information from two or more images into a single image. The resulting image will be more informative than any of the input images. 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, 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.
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 $\Delta_1$ and $\Delta_2$ of both images.
(4) An inverse curvelet transform step is performed on $P_3$ of the MR image and the fused subbands $\Delta_1$ and $\Delta_2$.

2. Data images
Data images are CT scan and MRI images of the same person.

3. CODE

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](image1.png)

![Figure 2. MRI IMAGE](image2.png)

Figure.1. CT SCAN

Figure.2. MRI IMAGE

![Figure 1. Snapshot 1](image3.png)

![Figure 2. Snapshot 2](image4.png)

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 edges of the images by curvelet fusion technique. And we calculated two edge based parameters QABF and UIQI.

VI. REFERENCES


[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.

