

A Comparison between Scilab inbuilt module and Novel method for image fusion

By

Deepali Kaushik, Himanshu Jain

KIET Ghazibad, India

NIT Meerut , India

Kaushikdeepali61@gmail.com, himanshunitcs@gmail.com

ABSTRACT

Image fusion is one of the important embranchments of data fusion. Its purpose is to synthesis multi-image information in one scene to one image which is more suitable to human vision and computer vision or more adapt to further image processing such as target identification.

This paper mainly compares the Scilab inbuilt module and novel method for image fusion. By using scilab as experimental platform, we approved the feasibility and validity of method. The result indicate that the fused image quality would be very effective and clear.

Keywords

Image fusion, multi-image, image processing.

1. INTRODUCTION

The term fusion means in general an approach to extraction of information acquired in several domain [1]. To produce the fused image we need several images of the same scene. It means we need at least two image as input in which the size of image should be same. Then the output (fused image) will be in one image of higher quality. We need image fusion in image processing because it requires both high spatial and high spectral information in one image. The goal of image fusion is to integrate complementary multisensor, multitemporal and multiview information into one new image containing information the quality of which cannot be achieved otherwise [2].

In this paper we will compare the scilab in-built module to novel method for fused image. In scilab, there is no need to create the code by us for image fusion because it is inbuilt module. In novel method, it is created by us which is completely based on mathematical concept. Then we will compare both method with their perspective result. Image fusion based novel method implemented in Scilab.

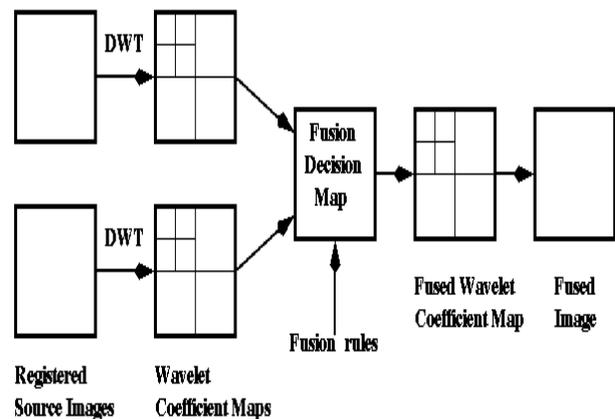


Figure 1: Image Fusion Method

2. LITERATURE SURVEY

As we studied various methods for image fusion that the statistical methods of pixel based image fusion techniques produced fused image on the basis of pixel value. Regression variable substitution (RVS) produced better result than other methods [3][4]. Wavelet transform and multi-wavelet transform method provide high quality spectral content but these methods are dependent on theory [5]. Novel method is independent to any type of theory, it is completely mathematical concept based. It is easy to implement than any other method. It is very simple and easy to understand than other methods. It produced efficient and high quality of clearly visible image.

3. NOVEL METHOD

This paper we define novel method. It is completely mathematically based method. We did not use any theory or application in novel method. It is very simple to implement. This method is used to image fusion in easy way. There is need at least two image in which the size of image should be same. Using the code of this method generates appropriate

result than other method. Now we will explain novel method in terms of code. Firstly we will take two image as named im1(a) and im2(b). The size of im1 and im2 should be same as well as of same scene after that we will take 3 zeros values according to the size of both image.

$fus=zeros(a,b,c)$

Where a, b, c are the pixel value Then image would be executed in three level ratio as-

For i=1: a

For j=1:2: b

For k=1:3

The first image im1(i,j,k)is copy into fus(i,j,k). The same procedure is apply for second image, finally it will produced fused image as-

`imshow(fus)`

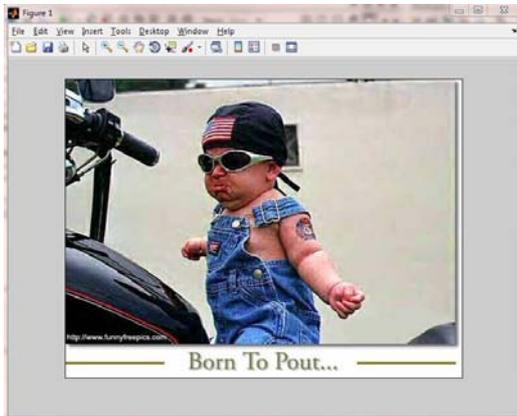


Figure 2: Im1

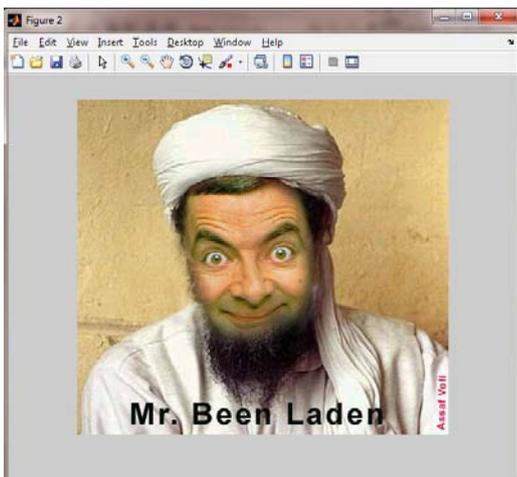


Figure 3: Im2

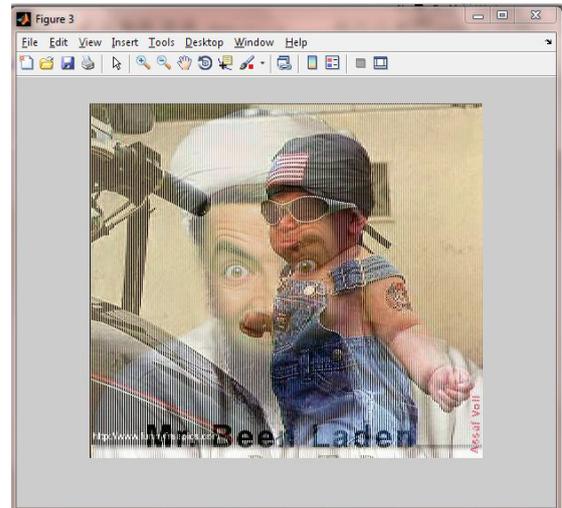


Figure 4: Fused image using novel method

Finally this novel method produce fused image c) as we can see this image seen clearly and effective.

4. CAMPARISION BETWEEN SCILAB MODULE AND NOVEL METHOD

Scilab module which is inbuilt, there is no need to create the code to generate fused image .in this method also we will take two image in the same scene as well as the size of image should be same. Scilab module used `imadd()` to generate fusion mage which is inbuilt method. It produced fused image randomly as seen in image d). But this image is not seen clearly than using novel method. The second image im2 b) is not shown clearly and the colour of fused image change.

Even it change the background colour. We can see image d) image is not shown properly and look like a blurred image. As we can see both fused image c) and d) and distinguish the property of the fused image on its own method.

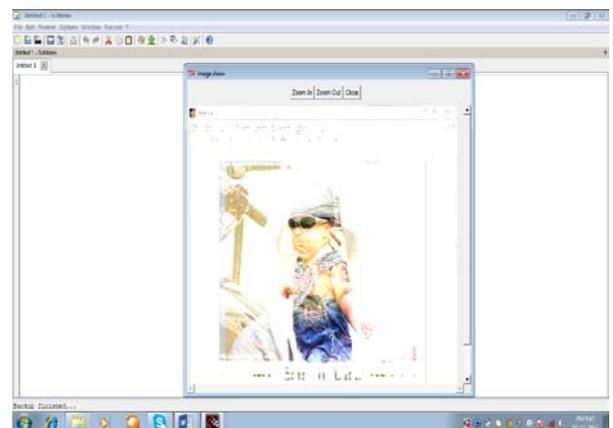


Figure 5: Fused image using scilab inbuilt method

5. CONCLUSION

Novel method is very effective method to produce the good pixel image. This paper provides a novel method for image fusion which is very effective and independent to any theory. The result show in image c) that is provide better performance and clarity than other fusion method.

6. REFERENCES

[1] Haozheng Ren, Yihua Lan, and Yong Zhang “Research of multi-focus image fusion based on M-band multi-wavelet transformation” IEEE Fourth International Workshop on Advanced Computational Intelligence Wuhan, Hubei, China; October 19-21, 2011.

[2] Wang Enjun “research on road image fusion enhancement technique based on wavelet transform”

IEEE Vehicle Power and Propulsion Conference (VPPC), September 3-5, 2008, Harbin, China

[3] Deepak kumar sahu, M.P.parsai “different image fusion techniques” international journal of modern engineering research (IJMER) Vol. 2, Issue. 5, Sep-Oct 2012 pp-4298-4301 ISSN: 2249-6645

[4] Ali A. AI-Zaky “The statistical methods of pixel- based image fusion techniques” international journal of artificial intelligence and knowledge discovery” Vol. 1, Issue 3 12 Aug 2011.

[5] Mirajkumar pradnya P, Sachin D. “image fusion method based on WPCA” international journal of advanced research in computer science and software engineering Vol. 2, Issue 5, May 2012.