Wavelet Based Image Fusion for Detection of Medical Images and General Images

Ambika Singh
Dept. of Telecommunication Engineering
Godutai College of Engineering
Gulbarga, India
ambsingh@gmail.com

Asst. Prof. Shivganga Patil
Dept. of Telecommunication Engineering
Godutai College of Engineering
Gulbarga, India

Abstract— **The fusion of images is the process of combining two or more images into a single image retaining important features from each of the images. If the images are not already registered, a point-based registration, using affine transformation is performed prior to fusion. The images to be fused are first decomposed into sub images with different frequency and then information fusion is performed using these images under the proposed gradient and relative smoothness criterion. Finally these sub images are reconstructed into the result image with plentiful information. The main features taken into account for detection of General image and medical image (i.e., brain), location of tumor and size of the tumor, which is further optimized through fusion of images, using various wavelets transforms parameters. We discuss and enforce the principle of evaluating and comparing the performance of the algorithm applied to the images with respect to various wavelets type used for the wavelet analysis. The performance efficiency of the algorithm is evaluated on the basis of PSNR (peak signal noise ratio) values. The obtained results are compared on the basis of PSNR with gradient vector field and big bang optimization. The algorithms are analyzed in terms of performance with respect to accuracy in estimation of tumor region and computational efficiency of the algorithms.**

Keywords—**emergency panic system, emergency call, war field secured information system, back up call system.**

I. INTRODUCTION

In this system we are focusing on mainly Fusion on general images and as well as Medical images. Before applying image fusion, the source images must be preprocessed through various Image enhancement techniques. The Image enhancement techniques involve point operations, mask operations, and global operations which sharpen image features for efficient analysis. The proposed algorithm mask operations were used for improve the efficiency of the image fusion algorithm through elimination of ambient elements from the source images. In this paper various results are obtained by changing the wavelet used for decomposition. The paper further discusses the variation in result on changing the parameters of wavelet transforms used for the decomposition.

II. OVERVIEW OF PROJECT

Wavelet transform is a powerful mathematical tool used in the fields of signal processing. It is used to divide the given function or signal into different scale components such that each scale component can be studied with a resolution that it matches. Mallat used the wavelets to be the foundation of new powerful approach to signal processing and analysis called the Multi-resolution Theory. The same approach has been extended to multi-dimensional signal decomposition. The most common form of transform image fusion is wavelet transform fusion. In common with all transform domain fusion techniques the transformed images are combined in the transform domain using a defined fusion rule then transformed back to the spatial domain to give the resulting fused image.
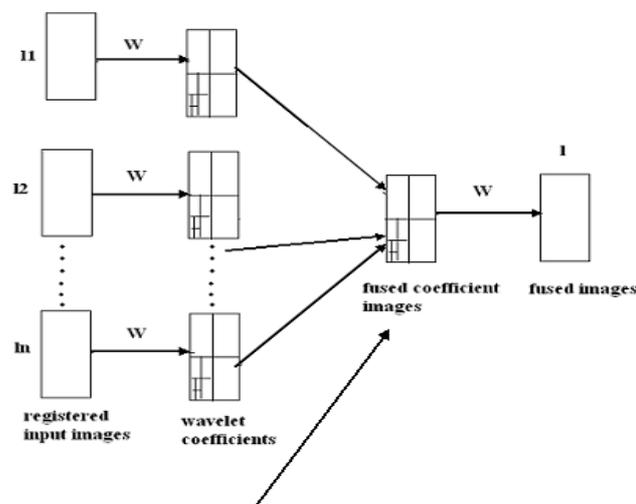
Figure 1: Fusion of wavelet transforms of Images

III.

IV. HARDWARE DESCRIPTION

The project would require the following hardware and software:
Hardware

• A normal desktop/laptop with 2 GB RAM, 160 GB HDD
Software
• Windows 7/ Windows XP OS
• MATLab /Open CV.

V. EXPECTED INPUT/OUTPUT EXAMPLES

Figure 2	Figure 3	Figure 4

Description:
Figure 2: Clock 1 is focused & clock 2 is out of focus
Figure 3: Clock 2 is out of focus & clock 2 is focused
Output: Figure 4 is the expected output.

VI. ADVANTAGES AND LIMITATIONS

The main advantage of using this wavelet based image fusion for detection of medical images and general images are that it is giving the efficient results, this technique is very much less time consuming and computation time required.

Limitations for existing systems

The present system gives the efficient results for only medical images.
And these systems recognize only MR and CT images (Magnetic Resonance & Computed Tomography).

VII. CONCLUSION

The range of communication can also be improved by using the satellite communication for military purpose. The range can be improvised by using very high rated RF communication module. This project can be implemented all over many fields like chemical laboratories, bio medical laboratories, mining areas, hospitals, etc. On improvising and on using reliable electronic devices which can make this project as a product so as released into market. GPS system can also be implemented to know the position of the user. The other sensors like temperature sensors can also be connected to the user's hand held transreceiver to obtain live environmental conditions.

REFERENCES

[1]. Subitha.V1, Jenicka.S, "Efficient Image Fusion in Color Images Using Multiresolution Transform Techniques" published International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 7, July 2013.
[2]. VivekAngoth, "ANovelWaveletBasedImageFusionforBrain Tumor Detection" Published in International Journalof Computer Visionand SignalProcessing,2(1),1-7(2013).