# Use of Wavelet Transform in Digital Aerial Images

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***Abstract*—** The Wavelet transform primarily performs a filter function on images. The Paper represents a new computational scheme Based on multiresolution decomposition for extracting the features of interest from the Digital Aerial Images by suppressing noise. In this paper, first of all preprocessing on the Aerial Images is done. So converting this image into grayscale then applying wavelets transform to improve the quality of image.

***Keywords:*** *Aerial images , wavelet Transform*

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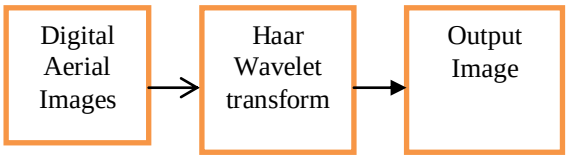
## I INTRODUCTION

Aerial images are those images which taken from the elevated Position. In this the camera is not supported by the ground based position. The platform of aerial photography is aircraft, helicopters, balloons and parachutes etc. The images are captured from the elevated position that having the lack of Clarity of the image. The visibility of image decreases and sometime the condition may have zero visibility of images. The captured images are not same as see in the real world scene. In this paper we used the wavelet transform for low frequency component of the image and edge detection algorithm to detect the edge feature of the images

The Wavelet Transform provides a time-frequency representation of the signal. A Wavelet is series representation of a square-integral (real or complex value) function by a certain orthonormal (two vectors in an inner product space are orthonormal if they are orthogonal (when two things can very independently or they are perpendicular) and all of unit length. consider image is a signal stream. main features of images is a the stable component of the signal and it is presented in the low-frequency component. The high-frequency component contains the noise and unstable edges information. The DWT coefficients can describe the various frequency information of the image . Therefore, in this paper first we decompose the image using DWT and then improve the quality of image.

In computer vision and image processing, The feature detection concept refers to methods that computing abstractions of image information and making local decisions at every image point whether there is an image feature of a given type at that point present or not. The resulting features is subsets of the image domain. Feature detection ,It is a low-level image processing operation. Means, it is usually performed as the first operation on an image, and detect every pixel to see there is a feature present at that pixel. If ,it is part of a larger algorithm, then the algorithm will only examine the image in the region of the features.

## II. OVERVIEW OF THE PROPOSED SCHEME




## III. HAAR WAVELET TRANSFORM

As we all know, CWT (Continuous Wavelet Transform) is the Inner product of original signal and analyzing wavelet. In order to reduce the amount of computation of CWT, DWT (Discrete Wavelet Transform) is proposed. It is Describe in term of a filter bank, which is consists of a low pass filter and high pass filter. We can get the low frequency components and high frequency components of original signal by DWT. In general, the low-frequency component is the most important Since the high frequency part of an “additive” effect. As for DWT, it is the most important to find a good wavelet Mi. Chen proposes that Haar wavelet is good character in image processing, for example: Best performance in term of computation time. Computation time is high called lossless compression. .It is fast transform. It is memory efficient compression, good de-noising effect and good image features to maintain the image characteristics. First in this paper, we choose Haar wavelet and decompose original image by DWT.

To Determine the Haar transform of an array of n samples:

1. Calculate the average of each pair of samples. (n/2 Averages)

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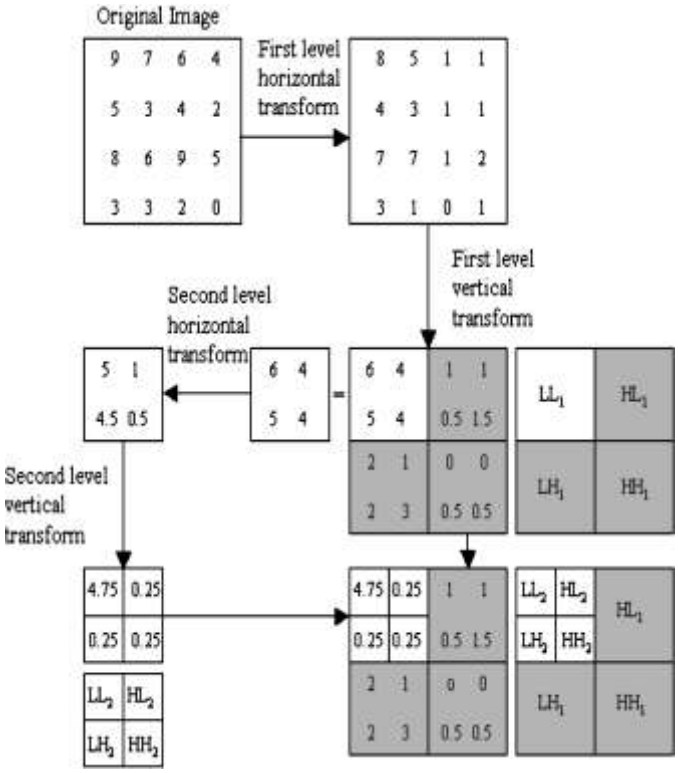
2. Calculate the difference between each average and original Pair of samples.
3. Write the first half of the array with averages.
4. Write the second half of the array with Differences.
5. Repeat the process on the first half of the array. While doing this the array size should be power of two.

For 2D Haar Transform [5] the procedure remains the same. For example, apply 2D HT to the following finite 2D signal..




## IV.RESULT

In this paper first digital aerial images which is colour image is converted into the gray image then applies haar wavelet transform. From this one level transform Low frequency component is calculated then applying second level of Haar Transform to find the very low frequency component of image. All this are implemented in MATLAB. Results are shown in fig 1,2,3,4.

## V. CONCLUSION

In this paper Haar Wavelet Transform is applied to Digital aerial image Improve the quality of the image the output are shown in below. Lastly by using any edge detection algorithm the edge feature of the images can be detected.

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Fig.1 Original Digital aerial image.

Fig.2 Grey Imge

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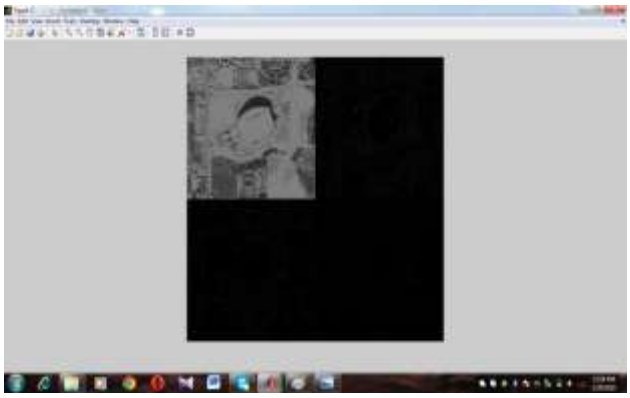

Fig 3 First Level Of Transform

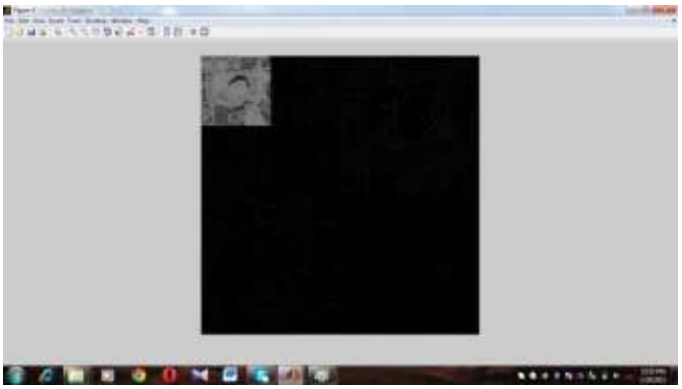

Fig.4 Second Level Of Transform