version R2009a). In addition to highlight the role of the proposed approach (noise variance) by preservation of the image's overall look, preservation of the diagnostic content in the image and detection of small and low contrast details in the diagnostic content of the image and to highlight the role of using image processing technique in Radiology.

3.1 Median filter

The median filter is normally used to reduce noise in an image, somewhat like the mean filter. However, it often does a better job than the mean filter of preserving useful detail in the image. Like the mean filter, the median filter considers each pixel in the image in turn and looks at its nearby neighbors to decide whether or not it is representative of its surroundings. Instead of simply replacing the pixel value with the mean of neighboring pixel values, it replaces it with the median of those values. The median is calculated by first sorting all the pixel values from the surrounding neighborhood into numerical order and then replacing the pixel being considered with the middle pixel value. (If the neighborhood under consideration contains an even number of pixels, the average of the two middle pixel values is used.) Figure 2 illustrates an example calculation.

80	81	79	79	79	80
80	81	79	79	79	80
80	81	79	79	79	80
79	79	77	77	78	78
79	79	79	79	80	80
79	79	80	80	81	81

Figure 2: Sample matrix value taken from figure 1

Neighborhood values: 77,77,79,79,79,79,79.79,81
Median Value is: 79

Figure 4-5 calculating the median value of a pixel neighborhood. As can be seen, the central pixel value of 81 is rather unrepresentative of the surrounding pixels and is replaced with the median value: 79. A 3×3 square neighborhood is used here larger neighborhoods will produce more severe smoothing. Anisotropic Filtering and Median Filtering algorithms are applied in ten different X-ray images and calculated the equivalent MSE and PSNR values. The original picture fig.3 RGP is changed into GRAY color fig.4. This gray color image applied into anisotropic filtering method the output is in fig.4.

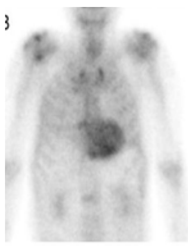

Figure 3: Shows the original of cardiac scintigraphy

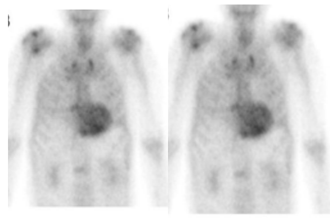

Figure 4: A and B shows median 5 and median 25 for image 4 respectively.

4. Stretchlim Technique

A two-element vector of pixel values that specify lower and upper limits that could be used for contrast stretching image I. By default, values in LOW_HIGH specify the bottom 1% and the top 1% of all pixel values. The gray values returned can be used by the imadjust function to increase the contrast of an image fig.5.

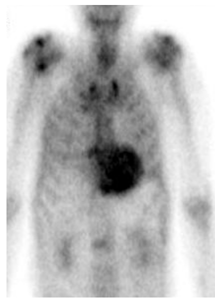

Figure 5: Shows Stretchlim technique

5. Image Addition Technique

Add two images or add constant to image
Z = imadd (X,Y) adds each element in array X with the corresponding element in array Y and returns the sum in the corresponding element of the output array Z. X and Y are real, nonsparse numeric arrays with the same size and class, or Y is a scalar double. Z has the same size and class as X, unless X is logical, in which case Z is double. If X and Y are integer arrays, elements in the output that exceed the range of the integer type are truncated, and fractional values are rounded

5.1 Contrast enhancement

The command that implements contrast processing is the imadjust. The general function that implements contrast enhancement is the following (figure 5):

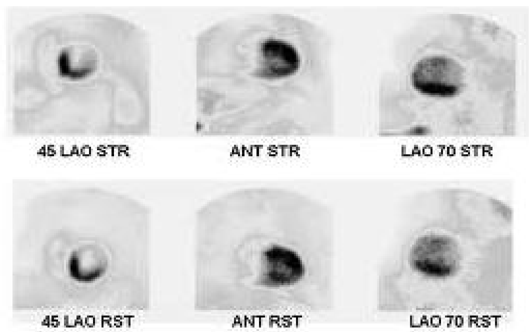

Figure 1: Shows Original cardiac scintography image

```
RGB2=imadjust(RGB1,[.2,.3,0;.6,.7 1],[]);
imshow(RGB1), figure, imshow(RGB2)
```

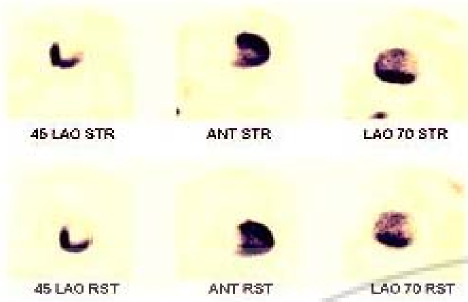

Figure 2: Shows bone scan image after adjustment

5.2 Removing Noise by Wiener filter

The wiener2 function applies a Wiener filter (a type of linear filter) to an image adaptively, tailoring itself to the local image variance. Where the variance is large, wiener2 performs little smoothing. Where the variance is small, wiener2 performs more smoothing. This approach often produces better results than linear filtering. The adaptive filter is more selective than a comparable linear filter, preserving edges and other high-frequency parts of an image. In addition, there are no design tasks; the wiener2 function handles all preliminary computations and implements the filter for an input image. wiener2, however, does require more computation time than linear filtering. Wiener2 works best when the noise is constant-power ("white") additive noise, such as Gaussian noise. The example below applies wiener2 to an image of Saturn that has had Gaussian noise added.

1. Read in an image. Because the image is a true color image, the example converts it to grayscale.

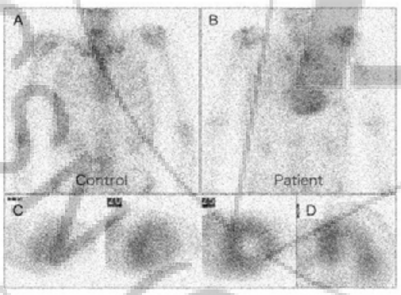

Figure 6: Shows Portion of the Image with Added Gaussian Noise

2. Remove the noise, using the wiener2 function. Again, the figure only shows a portion of the image

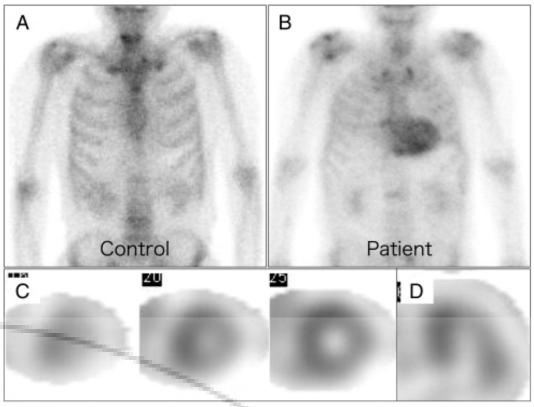

Figure 6: Shows Portion of the Image with Noise Removed by Wiener Filter

6. Conclusion

Preprocessing is to improve their quality of images. If these images are too noisy or blurred they should be filtered and sharpened. In image processing, filters are mainly used to suppress either the high frequencies in the image, i.e. smoothing the images or the low frequencies, i.e. enhancing or detecting edges in the image. Due to various factors the images are in general poor in contrast. Researchers applied image preprocessing to remove artifacts and degradations such as blurring and noise. A variety of smoothing filters have been developed that are not linear. While they cannot, in general, be submitted to Fourier analysis, their properties and domains of application have been studied extensively. For this reason researchers applied anisotropic filtering and median filtering. In study method anisotropic and median filtering algorithms were used. The another filter median used to reduce noise in an image, somewhat like the mean filter (it is a simple , intuitive and easy to implement method of smoothing images, i.e. reducing the amount of intensity variation between one pixel and the next. It is often used to reduce noise in images). The median filter is normally used to reduce noise in an image, somewhat like the mean filter. However, it often does a better job than the mean filter of preserving useful detail in the image. Like the mean filter, the median filter considers each pixel in the image in turn and looks at its nearby neighbors to decide whether or not it is representative of its surroundings. Instead of simply replacing the pixel value with the mean of neighboring pixel values, it replaces it with the median of those values. The median is calculated by first sorting all the pixel values from the surrounding neighborhood into numerical order and then replacing the pixel being considered with the middle pixel value. So conclusion of this research that image processing and analysis applied to nuclear medicine images for diagnosis, improve the acquired image qualitatively as well as offer quantitative information data useful in patient's therapy and care. Advanced techniques of image processing and analysis find widespread use in nuclear medicine. MatLab and Image Processing Toolbox enable both quantitative analysis and visualization of Nuclear Medicine images acquired as planar or angle projected images to reconstruct tomographic (SPECT, PET) slices and 3D volume surface rendering images.

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