A New Approach for Effective Image Retrieval of Different Medical Images

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Abstract- *Texture represents complex visual patterns having characteristics as brightness, color, slope, size, etc. The texture of an image can be considered as similarity grouping. Feature extraction in texture analysis is regarded as computation of characteristics of the image that can define the texture properties numerically. Texture may be of tamura, statistical, inverse difference, histogram gradients, etc. The spatial size of texture primitives describes the textual character of an image. The proposed method is tested for different possible cases like good medical image, single noisy medical image and noisy image with more noises. The quality parameters are calculated and compared for different methods.*

Keywords- Local Binary Patterns, Rotation, Dominant, Features, Image retrieval.

I. INTRODUCTION

Content-based image retrieval includes the steps such as; feature extraction of the database images, indexing, feature extraction of the query image, coordinating the query image feature with the feature database content for similarity comparison and some feedback from the user for ranking and display [1-5]. Feature extraction is the most vital step in content-based image retrieval. Two types of visual features are used in a content-based image retrieval system; they are primitive features and domain-particular features. The primitive feature defines color, shape, and texture, whereas face recognition, fingerprints recognition, etc., represents the domain specific features.

The usage of texture structure histogram and texture features in content-based image retrieval is explained in [6-7]. The texture is regarded as one of the most important features in content-based image retrieval system. In this work, image retrieval based on texture structure histogram and Gabor texture feature extractions are presented. The texture structure histogram technique is used to describe the texture feature by using the edge orientation and color information method. In this arrangement, the HSV color space is used for human visual perception mechanism. Non-equal interval quantization scheme is used to make the image content more reasonable. Gabor texture feature extraction method is regarded as the most important texture feature analysis method [8-10]. The image texture feature is retrieved by using mean and variation of Gabor filtered image. Comparison of both the texture feature extraction techniques is discussed. The results demonstrated that the suggested algorithms performed well in image retrieval process. This framework provides good retrieval performance and is shown efficient among those reported in the literature. The medical image retrieval parameters can be evaluated for different situations and can be compared.

II. PROPOSED METHOD

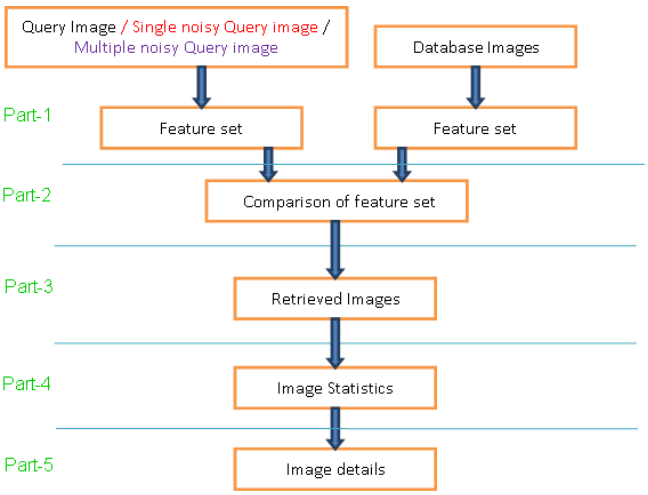


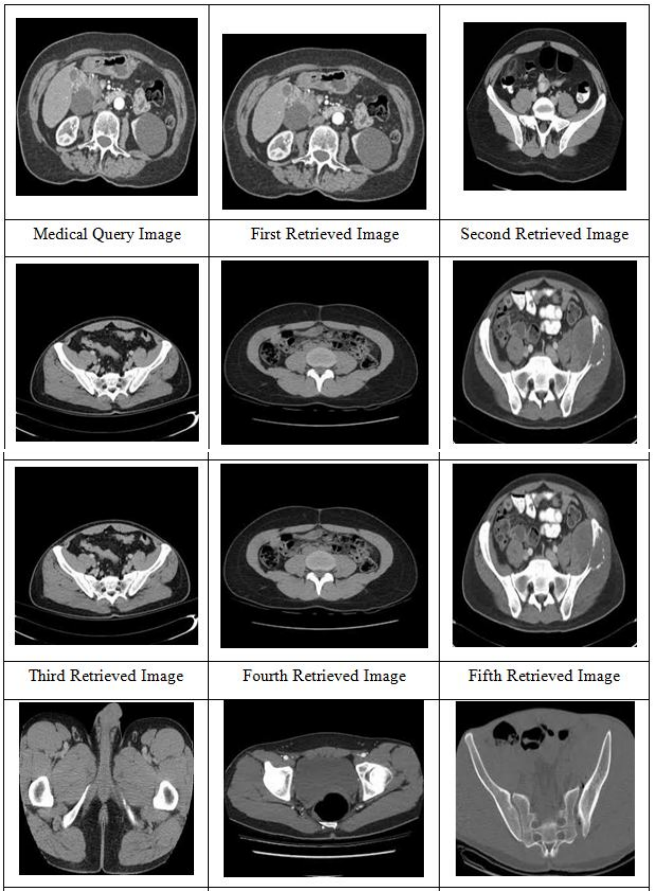
Figure 1: Flow chart of the overall proposed method

The medical images like X-ray image, magnetic resonance image, computed tomography scan image are considered in the work. Standard sized images are taken in the process. The medical image is taken in three different cases like without noise, single noise image by considering speckle

noise and multiple noisy image by considering two noises like speckle noise and salt and pepper noise.

In thisretrievingmethod as shown in figure 1,statistical, tamura, histogram of gradient, Difference movements and dominant Rotated Local Binary Patterns feature extraction have been evaluated for the taken medical images. Same features have been evaluated for testing image also. The feature set has been reduced for easy process of retrieving process. The reduced feature set of testing medical image and reduced feature set of training medical set have been compared and the best suited values images are noted. The retrieving process can be displayed the results of retrieving process. The comparison of these images gives the three classes confusion matrix. From confusion matrix, the parameters like F1 scope, Recall, specificity, precision and different accuracy values are calculated. These quality parameters can be compared with different state of art retrieving methods. The results of these methods can be used for better medical diagnosis in the remote areas and for junior doctors.

III. RESULTS AND DISCUSSION



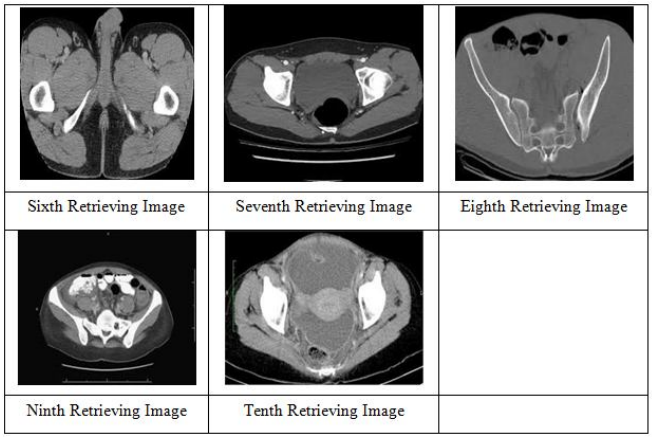


Figure 2:Query image and its ten retrieved images

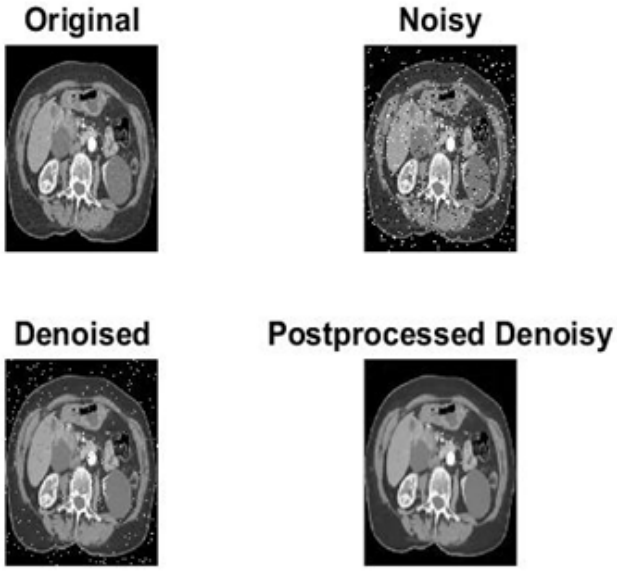
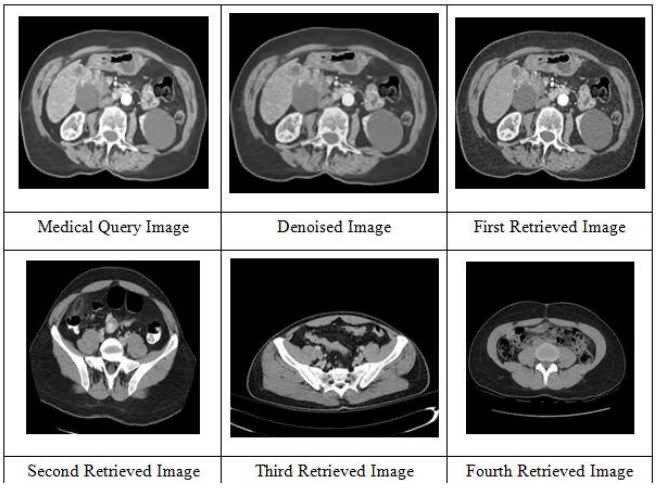


Figure 3: Query image and its processed images (Speckle noise image)



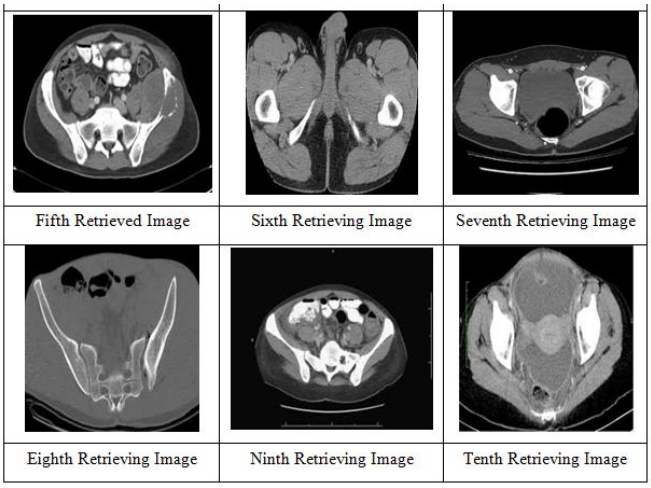


Figure 4: Query image and its ten retrieved images (Speckle noise image)

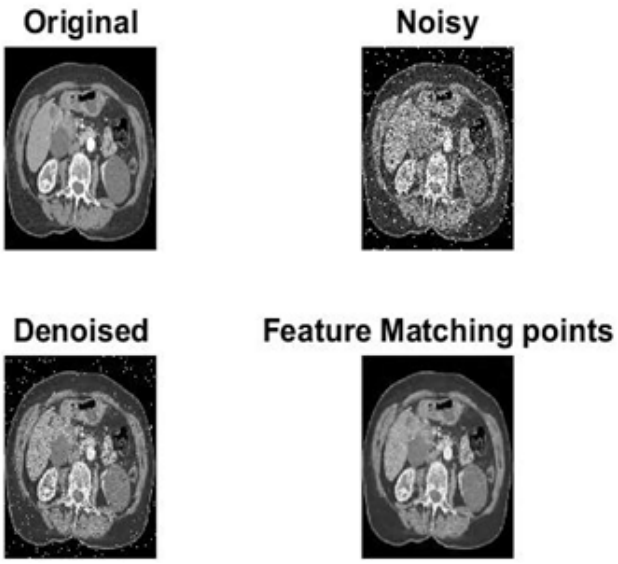
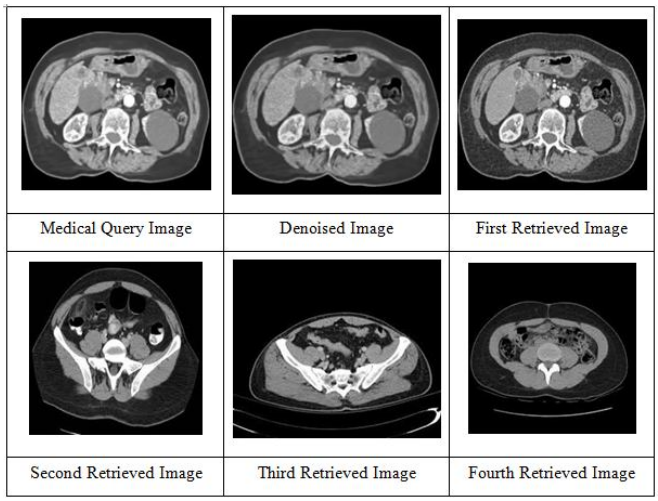


Figure 5: Query image and its processed images (Multiple noisyimage)



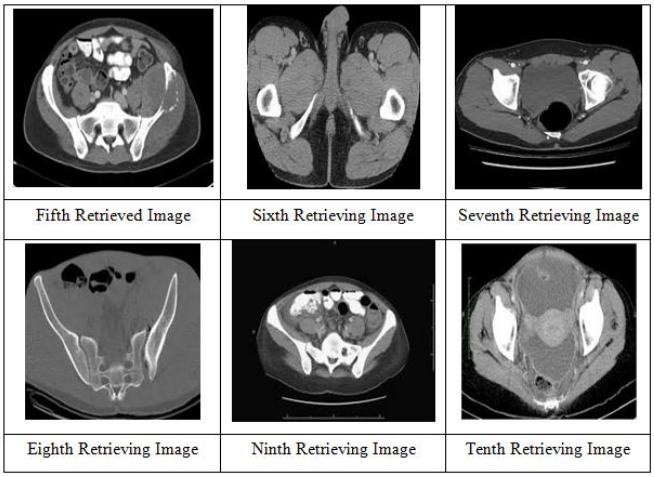


Figure 6: Query image and its ten retrieved images (Multiple noisy image)

A suitable medical query has been considered for retrieving process. The retrieved images are given in figure 2.The same image is considered for next process, by considering speckle noise in the image. The noise is removed and been enhanced with pre-processing techniques. It is shown in figure3. The retrieved images are given in figure 4. The same image is considered for next process, by considering salt and pepper, and speckle noise in the image. The noise is removed and been enhanced with pre-processing techniques. It is shown in figure5. The retrieved images are given in figure 6.

IV. CONCLUSION

The proposed method has been used for retrieving medical images. The process has been tested for noiseless images, noisy images and multiple noisy images. Best ten images have been retrieved for all the cases. It has retrieved the best images which are very much nearer to the original image. It is very much useful to a doctor to take decision based all the histories of the best suited images to query image.

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