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Validation of Medical Image Devices for Detection and Diagnosis of Various Diseases by Using Soft Computing Tools

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ABSTRACT

The imagining technologies employ conventional projection radiography, computed tomography, MRI, Ultra-sonography etc. Image processing techniques plays an important role in clinical studies of different diseases. Current manual methods of measurement are difficult and subjective. Our purpose is to expedite clinical research with an accurate, reliable and intelligent digital image processing method. The medical imaging research will investigate new modalities and improvements to existing ones for clinical diagnosis. The objective of the present research work is to develop intelligent interpretation using a different approach for improving the quality of imaging device and quantitative image analysis to provide a guide for clinicians to improve the quality of diagnosis and increase therapy success by early detection of diseases. It is essential to have a good quality of images in this regard this work will make attempt to develop various techniques.

KEYWORDS: Imagining, Technology Interpretation, Imaging Device and Quality

I. INTRODUCTION

By the growing use of direct digital imaging systems for medical diagnostics, digital image processing becomes more and more important in health care. In addition to originally digital methods, such as Computed Tomography (CT) or Magnetic Resonance Imaging (MRI), initially analog imaging modalities such as endoscopy or radiography are nowadays equipped with digital sensors. Digital images are composed of individual pixels (this acronym is formed from the words “picture” and “element”), to which discrete brightness or color values are assigned. They can be efficiently processed, subjectively evaluated, and made available at many places at the same time by means of appropriate communication networks and protocols, such as Picture Archiving and Communication Systems (PACS) and the Digital Imaging and Communications in Medicine (DICOM) protocol, respectively. Based on digital imaging techniques, the entire spectrum of digital image processing is now applicable in medicine.

The development of medical imaging over the past years has been truly revolutionary. For example, wireless capsule endoscopy and telemedicine systems have provided some of the most effective diagnostic tools in the field of health science. These systems involve X-ray images, CT scan images, and endoscopic images that require a large volume of storage, as well as bandwidth for data transmission, which in turns increase the cost and transmission time. The need is then to have an effective and efficient compression and decompression algorithm that is capable of achieving higher compression ratio while preserving the critical image/video information for better data reconstruction. Image data is a combination of information and redundancy, the information is maintained. Image processing, low-level processing denotes manual or automatic techniques, which can be realized without a prior knowledge on the specific content of images. This type of algorithms has

similar effects regardless of the content of the images. For example, histogram stretching of a radiograph improves the contrast as it does on any holiday photograph. Therefore, low-level processing methods are usually available with programs for image enhancement.

II. METHODOLOGY

Segmentation is an important process to extract information from complex medical images. Segmentation has wide application in medical field [3-4]. The main objective of the image segmentation is to partition an image into mutually exclusive and exhausted regions such that each region of interest is spatially contiguous and the pixels within the region are homogeneous with respect to a predefined criterion. Widely used homogeneity criteria include values of intensity, texture, color, range, surface normal and surface curvatures. In the past, many researchers in the field of medical imaging and soft computing have made a significant survey in the field of image segmentation. Expert knowledge can be used to formulate human rules for interpretation and accordingly fuzzy aspects of segmentation can be utilized effectively for localization of image. In this research work, it is proposed to develop a fuzzy model of interpretation of the image. Statistical aspects of several images will be taken into consideration. Statistical aspects include similar age group features of the tumor, the pattern of variation and correlation for the different case of patients will be given due consideration.

The past, present, and future paradigms of medical image processing are composed the pragmatic issues of image generation, processing, presentation, and archiving stood in the focus of research in biomedical image processing, because available computers at that time had by far not the necessary capacity to hold and modify large image data in memory. The former computation speed of image processing allowed only offline calculations. Until today, the automatic interpretation of biomedical images still is a major goal. Segmentation, classification, and measurements of biomedical images are continuously improved and validated more accurately since validation is based on larger studies with high volumes of data. Hence, we focused this on image analysis and the processing steps associated with it. The future development is seen in the increasing integration of algorithms and applications in the medical routine. Procedures in support of diagnosis, treatment planning, and therapy must be easily usable for physicians. It is proposed to develop a separate expert system for interpretation of different medical images.

With the suggested approach, two objectives will be fulfilled:

1) a more accurate handling of the severe case and

2) any unusual case can be used as a new case for training the software to avoid future failure of interpretation.

III. SUMMARY AND CONCLUSION

Functional requirements:

In this survey paper various automatic detection methods of brain diseases through MRI has been studied and compared for the period of more than two decades. The literature survey shows that the tumor region is classified without identifying tumor region from brain and Liver region. Also, they don't classify the subcategories of benign and malignant tumor.

IV. REFERENCES

[1]Heiken J.P, Wegman P.J, and Lee J.K.T, "Detection of focal hepatic masses: Prospective evaluation with CT, delayed CT, CT during arterial photography and MR imaging", Radiology, vol. 171, pp. 47-51, 1989.

[2]E-Liang Chen, Pau-CHoo Chung, Ching-Liang Chen, Hong-Ming Tsai and Chein I Chang, "An Automatic Diagnostic system for CT Liver Image Classification", IEEE Transactions Biomedical Engineering, vol.45, no. 6, pp. 783-794, June 1998.

[3]Chung-Ming Wu, Yung-Chang Chen, Kai-Sheng Hsieh,"Texture features for Classification of Ultrasound Liver Images", IEEE Transactions on Medical Imaging, vol 11, no 2, pp. 141-152, June 1992.

[4]Yasser M. Kadah, Aly A. Farag, Jacek M. Zaruda, Ahmed M. Badawi and Abou-Bakr M. Youssef., "Classification Algorithms for Quantitative Tissue Characterization of Diffuse Liver Disease from Ultrasound Images," IEEE Transactions on Medical Imaging Vol 15, No.4, pp 466-477, August 1996.

[5]Aleksandra Mojsilovic, Miodrag Popovic, Srdjan Markovic and Miodrag Krstic, "Characterization of Visually Similar Diffuse Diseases from B-Scan Liver Images using Non Separable Wavelet Transform", IEEE Transactions on Medical Imaging, vol. 17, no. 4, pp. 541-549, Aug. 1998.

[6]E-Liang Chen, Pau-CHoo Chung, Ching-Liang Chen, Hong-Ming Tsai and Chein I Chang, "An Automatic Diagnostic system for CT Liver Image Classification", IEEE Transactions Biomedical Engineering, vol. 45, no. 6, pp. 783-794, June 1998.

[7]S. Pavlopoulos, E. Kyriako, D. Koutsouri, K. Blekas, A. Stafylopatis, and P. Zoumpoulis, "Fuzzy Neural Network-Based Texture Analysis of Ultrasonic Images", IEEE Engineering in Medicine and Biology, pp. 39-47, Feb 2000.

[8]Jae-Sung Hong, Toyohisa Kaneko, Ryuzo Sekiguchi and Kil-Houmpark, "Automatic Liver Tumor Detection from CT", IEICE Trans. Inf. &st., Vol. E84-D, No. 6, pp 741-748, June 2001.

[9]Gletsos Miltiades, Stavroula G Mougiakakou, George K. Matsopoulos, Konstantina S Nikita, Alexandra S Nikita, Dimitrios Kelekis, "A Computer-Aided Diagnostic System to Characterize CT Focal Liver Lesions: Design and Optimization of a Neural Network Classifier," IEEE Transactions on Information Technology in BioMedicine, Vol 7, Issue1
.
[10]John.E.Koss, F.D.Newman FD, T.K.Johnson, and D.L.Kirch, "Abdominal Organ Segmentation Using Texture Transforms and a Hopfield Neural Network", IEEE Transactions on Medical Imaging, vol 18, no. 7, pp 640-648, July 1999.