

قال تعالى :

مَنْ هُوَ قَانِتٌ آنَاءَ اللَّيْلِ سَاجِدًا
وَقَائِمًا يَحْذَرُ الْآخِرَةَ وَيَرْجُو رَحْمَةً
رَبِّهِ قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ
وَالَّذِينَ لَا يَعْلَمُونَ إِنَّمَا يَتَذَكَّرُ أُولُو
الْأَلْبَابِ {

صدق الله العظيم

[الزمر : 9]

Dedication

This research is dedicated to

My dear father

My dear mother

**My Brothers & sisters Source
of support in my life and my
Nephew and my Nieces**

My Loyal Friends

And all my teachers

Acknowledgment

I would like to take this opportunity to express my profound gratitude and deep regard to Dr. YOUSIF MOHAMED YOUSIF, for his exemplary guidance, valuable feedback and constant encouragement throughout the duration of the project. His valuable suggestions were of immense help throughout my project work. His perceptive criticism kept me working to make this project in a much better way. Working under him was an extremely knowledgeable experience for me. And also thank everyone who helped me to complete this search

Abstract

Advanced technologies in image processing and analysis are used extensively in nuclear medicine, working to improve nuclear medicine images, image data are used to gather details from location of the diseases or physiological processes. This study aims to enhancement of bone scintigraphy Image by using image processing technique and have been using MATLAB program is used to enhance the quality of the images , The random sampling consists of 10 patients who underwent bone scintigraphy scan ,the study was conducted and taking information from Niles Center for Nuclear Medicine, data were collected in the period between July 2014 to January 2015. MATLAB program techniques such as Contrast-limited adaptive histogram equalization (CLAHE), histogram equalization, Adjust image intensity values or colormap, 2-D median filtering and contrast stretch image, are used on this study to analyzed and Enhanced data (bone scan images). This study showing a significant difference between the original image and the image that processed using MATLAB techniques, in terms of contrast especially in homogeneous areas and had been avoided the amplifying of any noise that might be present in the image by (CLAHE), extracting of the foreground from the background by using histogram as guide for threshold value and enhance the contrast of images (bone scan) by using histogram code and

Contrast stretch image ,the Adjust image code used to enhance the images by increasing of contrast, the reduce of the "salt and pepper" noise by using 2-D median filtering; median filter was more effective than convolution when the goal is simultaneously reduce noise and preserve edges.

الخلاصة

التقنيات المتقدمة في معالجة الصور و تحليلها تستخدم على نطاق واسع في الطب النووي و ذلك لانها تعمل على تحسين صور الطب النووي بشكل كبير جدا و ايضا يمكنها فصل المعلومات المطلوبة عن باقي الصورة , وتستخدم بيانات الصورة لجمع تفاصيل عن مكان وجود الامراض أو العمليات الفيزيولوجية. هذه الدراسة تهدف الي تحسين صور فحص العظام الومضاني باستخدام تقنيات معالجة الصور و قد تم استخدام برنامج الماتلاب لتحسين جودة الصور, تم اخذ عينات عشوائية تتكون من 10 مرضى خضعوا لالفحص الومضاني للعظام, وقد تمت الدراسة و اخذ المعلومات من مركز النيلين للطب النووي, وتم جمع البيانات في الفترة بين يوليو 2014 الي يناير ٢٠١٥. تقنيات تحسين الصور الموجودة في برنامج الماتلاب مثل معادلة تباين تكيف الرسم البياني المحدودة (م ت ت ا) , معادلة التمثيل البياني, وضبط صورة قيم الكثافة أو خارطة الألوان, 2- د متوسط الترشيح وتباين الصورة الممتد. وقد استخدمت في هذه الدراسة لتحليل و تعزيز البيانات (صور فحص العظام). هذه الدراسة توجد الفرق الكبير بين الصورة الأصلية والصورة التي تم تحسينها باستخدام تقنيات الماتلاب من حيث التباين وخاصة في

المناطق المتجانسة وتجنب تضخيم أي ضوضاء قد تكون موجودة في الصورة عن طريق استخدام (م ت ا ا), وفصلت المقدمة من الخلفية باستخدام الرسم البياني كدليل لقيمة العتبة وتم تعزيز تباين البيانات (صور فحص العظام) باستخدام تقنية معادلة الرسم البياني، وايضا تعزيز (صور فحص العظام) من خلال زيادة التباين في الصورة باستخدام تقنية ضبط الصورة، وتم خفض الضوضاء "الملح والفلل" باستخدام 2- د متوسط الترشيح ، وهذا المرشح أكثر فعالية من الإلتواء عندما يكون الهدف هو الحد من الضوضاء والحفاظ على الحواف في وقت واحد.

List of Abbreviations

MRI: magnetic resonance imaging

CT: computed tomography

SPECT: photon emission computed tomography

PET: positron emission tomography

DEXA or DXA: Dual-energy X-ray absorptiometry

MDP: methylene-diphosphonate

γ : Gamma rays

NM: Nuclear medicine

^{18}F -FDG: fluorodeoxyglucose (is a radiopharmaceutical used in the medical imaging modality (PET))

FoV: Field of View

RGB image: Red, Green and Blueimage

Ft : Fourier transform

[BW]: bwboundaries traces the exterior boundaries of objects, as well as boundaries of holes inside these objects in the binary image

CLAHE: Contrast-limited adaptive histogram equalization

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